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AUTHOR Saunders, Minta M.
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ABSTRACT

To identify any differences in emotional/personality development of a group of infants reared at home and a matched groups of infants enrolled in a day care center, data were obtained on behaviors of two groups of infants. The sample consisted of 15 demographically matched pairs of infants, ages 3-24 months at entrance. Data were collected through observation, questionnaires, administration of the Bayley Scales of Infant Development, and monthly telephone interviews with mothers. Five measures of emotional and personality development were used to assess the two groups: reaction to stranger, patterning, separation from mother, exploratory behavior, and eating and sleeping patterns. No significant differences were found between the Home and Center groups. However, since day care services are growing rapidly, it is clear that more research is needed to: (1) understand the complexity of the acquisition of attachment, which is crucial to development; (2) analyze the components of contingent responding; and (3) provide more detailed and definitive analyses of care-giving situations so the results may be incorporated in training techniques. (JF)

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There is general agreement among theorists that the infant-mother relationship, or attachment, significantly affects the emotional and personality development of the young child. Separation of the infant from his mother which interferes with or dilutes this relationship is believed to have serious developmental consequences. There is concern about brief separations which infants today are experiencing in day care settings. It is important to determine if there are differences in emotional and personality development of infants in day care that might be a function of their being separated from their mother for eight to ten hours a day, five days a week, and cared for by a number of caregivers.

A comparison was made between a group of infants reared in their own homes by their own mothers and a matched group of infants enrolled in a day care center. The infants were matched on sex, race, age, education and age of parents, and somewhat less exactly on birth order. Twelve pairs of infants were between the age of three months and 13 months of age at enrollment; three pairs were between 13 months and 24 months of age.

Data were obtained on 15 matched pairs of infants on behaviors believed to be indices of the quality of the infant-mother relationship: fear of strangers, exploratory behavior, and eating patterns and sleeping routines.

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A statistical test (a multivariate analysis) of the data on infants' reaction to strangers indicated that there was no difference between the infants being cared for at home and infants enrolled in a center providing quality care.

It was apparent that the data did not support the literature which reports that infants begin to show fear of strangers in the second half of the first year of life. There were very few reactions in either group that could be described as fearful.

The results indicated, however, that both Home and Center children show an appropriate and intelligent awareness of and the capacity to discriminate between family members and unfamiliar adults. The children continued to respond to this dimension of "familiar/unfamiliar" in a characteristic pattern that shows a relationship from one age to another. The findings seriously question the fear-of-stranger concept.

The child who has a healthy attachment to his mother is believed to be able to use his mother as a secure base from which to explore. Although it had been reported (Keister, 1970) that there was no difference between the two groups of children in their total scores on the Bayley Scales of Infant Development (Mental and Motor), administered at quarterly intervals up to age 12 months and semi-annually thereafter, there was concern that the Center infants might have performed less well than Home infants on exploratory items.

A statistical analysis of the exploratory items on the Bayley Mental Test indicated there was no significant difference between the Home and Center children in their performance on these items. Those small differences which were found seemed to favor the Center children. It appeared that enrollment in the day care center had not affected the Center infants' primary attachment to the mother as this attachment is reflected in performance on exploratory test items.

Tests of significance (*t*-tests) of the difference between the mean number of mothers' responses to questions on eating and sleeping indicated no differences between the matched pairs of Center and Home children on three questions ("eating well?", "sleeping well?", and "changes in sleeping routine?") for the first month after the Center children were enrolled. There were no differences between the two groups the second month after the Center children's enrollment for the two questions related to sleeping; however, the mothers of Center children answered "no" to the question, "Has your child been eating well during the last week?" significantly more frequently than did the mothers of children cared for in their own homes.

The mothers in both groups reported no severe emotional upsets or problems related to their infants' eating and sleeping behavior.

SOME ASPECTS OF THE EFFECTS OF DAY CARE ON INFANTS' EMOTIONAL AND PERSONALITY DEVELOPMENT

by

Minta M. Saunders

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Approved by

Mary Elizabeth Keister
Dissertation Adviser

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APPROVAL SHEET

This dissertation has been approved by the following committee of the Faculty of the Graduate School at The University of North Carolina at Greensboro.

Dissertation Adviser Mary Elizabeth Keate

Oral Examination Committee Members

Eunice M. Turner

Rebecca M. Smith

November 10, 1971
Date of Examination

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CHAPTER I

INTRODUCTION

Purpose of the Study

Patterns of infant care have been described throughout man's recorded history, but Freud's emphasis on the importance of the early years of childhood for all later personality development gave impetus to efforts to find relationships between child-care practices and later behavior.

Researchers and practitioners in fields related to the growth and development of children are concerned with the problem of determining those conditions under which children thrive and develop optimally and of identifying those conditions which appear to be damaging.

The purpose of the present study is to examine some aspects of the effects of day care on infants' emotional and personality development. Data related to this development have been collected as part of an ongoing project involving group care of infants at the University of North Carolina at Greensboro. These data have been analyzed in an attempt to identify differences between children reared at home and children cared for during the day in a group situation. The present study devotes special attention to the sort of emotional and personality development believed to be related to the infant-mother relationship. There

is a legitimate concern that the children in group care may show differences that could be due to a dilution of the infant-mother relationship, since these infants spend from eight to ten hours a day, five days a week, away from their own mothers.

The present study was designed to assess carefully some aspects of the effects of day care on emotional and personality development.

The study raised the following questions:

1. Are there differences in reaction to strangers among children reared at home and children in daytime care away from their own homes?
2. Is there any patterning to the development of "reaction to strangers?" The literature describes and predicts much stronger reaction at certain ages than at other ages. Do the infants in the two groups differ in any way in their responses at some "peak" period?
3. Is an infant's reaction to a stranger related to some other measure of his relationship to his mother, e.g., his willingness to allow his mother to leave (or separate) from him? Do the two groups differ in this relationship?
4. Does enrollment in day care affect exploratory behavior? It is reported that an infant's attachment to his mother enables him to use her as a secure base from which to explore, thus enhancing his opportunities for learning.

5. Does enrollment in day care affect eating and sleeping behavior? It is reported that separation of an infant from his mother is traumatic for the infant, and that even brief separations may be reflected in problems in eating and sleeping behaviors.

An earlier report (Keister, 1970a) on a study of infants in home care and in group care indicated that their performance on tests of mental, motor, and social development had not been adversely affected by day care. Analysis of repeated measures on mental, motor, and social development on matched subjects in the experimental (Center) and control (Home) groups indicated that there was no basis for rejecting the hypothesis that there would be no difference between children reared in their own homes by their own mothers, and children enrolled in a quality day care program. Important research questions related to emotional and personality development of these infants, however, remained unanswered.

A healthy relationship with the mother is believed to be necessary for normal emotional/personality development of the infant. Most of the evidence for the importance of this relationship comes from studies of children who were reared in situations in which a mother-figure was lacking and opportunity for development of a close, one-to-one infant-adult relationship did not exist. Failure of the infant to form a close relationship, or primary attachment, to the mother (or a mother-substitute) is believed by many to result in damaging developmental consequences.

Placing infants in group day care raises the question of what will happen to an infant's primary attachment to his mother if he is separated from her for long portions of the day and cared for by a number of other adults. How much separation and how many "substitute mothers" can an infant tolerate before the formation of a primary attachment to his own mother is interfered with, and without suffering damaging consequences to his emotional/personality development?

A requisite for healthy emotional/personality development is a healthy infant-mother relationship, or quality attachment. Behavior believed to be indicative of attachment and related to emotional/personality development includes:

1. the infant's reactions to strangers
2. the infant's reactions to his mother separating herself from him, i.e., leaving him
3. the infant's ability to use his mother as a secure base from which to explore his environment, and
4. the infant's eating patterns and sleeping routines.

Measures of these behaviors have been collected for a comparison between infants in day care and infants in home care. Data have been collected on:

1. infants' reactions to strangers and response in situations in which an infant is enticed to separate himself from his mother to go to a stranger

2. mothers' reports of their child's reactions when the mother separates herself from him, i.e., she leaves him with a babysitter
3. performance in a testing situation in which exploratory test items are presented to the child with mother present, and
4. mothers' reports from telephone interviews on their infants' eating patterns and sleeping routines.

Rationale for Interest in the Present Study

It is important to attempt to answer questions related to the effects of day care on emotional/personality development as a part of the total evaluation of the on-going Demonstration Project on Group Care of Infants currently under way at the University of North Carolina at Greensboro. The study has implications for the whole area of infant day care. Working mothers in this country are demanding provision for day care for their infants at an increasing rate. If adequate care is to be provided for these children, it is necessary to determine, wherever possible, any inherent risks to the development of infants in groups.

The 1970 White House Conference on Children reported that 30 per cent of the mothers of children under six were in the labor force. This is equivalent to slightly over four million women in this category.

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A survey (Keister, 1967) in Guilford County focused on arrangements for day care of infants (children under three years of age) reported that 16 per cent of the total sample of 682 babies, i.e., slightly over 100 babies, were in daytime care outside their own homes, with these arrangements in a majority of cases made before the children were one year old, and in many instances before they were six months old. If the figure of 16 per cent of infants in care away from their own homes is representative of the urban situation in Guilford County one might estimate, on the basis of census figures listing in the county 13,000 children under three, that 2,000 infants in this one county may be in out-of-home day care facilities.

Group care of infants has not been encouraged in recent years in our society. The Child Welfare League of America in its 1960 Standards for Day Care Service stressed that parents must be helped to realize that a young child should be cared for in his own home by his own mother, and stated that if children under three must be cared for outside their own homes, they should have individual care in a family situation, not in groups or a group facility. The 1966 revision of the League's standards took a modified but still extremely cautious position, and continued to recommend family day care as the best alternative to at-home care for children under three years of age.

In this country, despite the fact that mothers are given the advice that they should take care of their own babies, more and more women are seeking -- and demanding -- day care arrangements for their babies. The demand may be attributed in part to the increased cost of living, one-parent families, the psychic needs of modern women for fulfillment outside the home, and the Women's Liberation movement. There is also a confrontation between students and universities, as students in desperate need of day care for their children demand that universities assume some responsibility for providing this care. Industries are exploring some possible advantages (e.g., in terms of reduced absenteeism) of day care facilities for women employees and at the same time responding to pressures from women for day care provisions. There is also social concern for continuing education for teenage mothers, many of whom have not finished high school, and for the well-being of their infants. Provision of day care for these infants is being sought so that their mothers can remain in school. Franchised day care operations are springing up all over the country in response to increasing demand for services.

It is no longer profitable to debate the question of whether or not mothers should place their infants in day care and return to school or accept gainful employment. The fact is that it is happening, and "services" and "facilities" are mushrooming.

The question that should be asked is: What are the effects of group day care on infants and how can we make this experience for babies as good as possible and as little damaging as possible? Regrettably the period of infancy is the vast unknown in the larger study of human growth and development. Relatively little is known about the effects of child rearing practices on growth and development and even less is known about the effects of group day care experiences on infants.

Caldwell (1964) reviewed the literature on the effects of infant care and recognized the lack of conclusive evidence for the relationship between infant care practices and later child or adult personality. Swift (1964) reviewed the literature on the effect of early group experience, but for the most part research studies were based on children attending nursery schools and no research was reported on infants in group care.

The Final Report (Keister, 1970a) of the Demonstration Project: Group Care of Infants at the University of North Carolina at Greensboro described this experience:

> . . . Even before our Nursery was opened, we were being asked for reports, asked to share findings, asked to provide 'all information pertaining to infant and toddler group care . . .' Since early 1967 our mail bag has bulged with requests for informational materials, for advice and suggestions:
>
> (1) from departments of health, social services, human resources, etc., at state, county, and city levels concerned with licensing and/or criteria for quality programs for infants and with training of staff for consultation or for conducting programs for infants;

(2) from universities and colleges establishing laboratories for infant development for research and teaching, or from researchers working with infant subjects, or from school systems planning to establish programs for continuing education for teen-age mothers and to provide day care for their babies;

(3) from federal programs in the Office of Economic Opportunity or Office of Child Development: Head Start training, CAP directors and planners, Parent and Child Centers in planning or operational stages;

(4) from other federal programs; for example, The Appalachian Regional Commission, senators, presidential assistants, Agriculture and Home Economics Extension, etc.

(5) from voluntary agencies at community and headquarters levels; United Fund groups, Community Councils, National Council of Jewish Women, Catholic Charities, Junior League, Florence Crittenton Homes, etc.

(6) from a variety of other sources, including non-university-related research centers, hospitals, day care programs in churches, etc. (pp. 2-3).

This Demonstration Project has provided valuable guidelines and still the requests for information, results, and materials pour in. From the Final Report (Keister, 1970a) comes the admonition to move into the field of infant day care very cautiously as there is much that remains to be learned and to be demonstrated. There are many unanswered questions about the effects of day care on very young children.

Keister (personal communication, 1970) has stated, "Exploration of this problem (infant-mother separation) is essential in any evaluation of the experience of day care for infants. The whole question of what happens to the infant's 'attachment' to his mother and to those who care for him during the day remains essentially unresearched. And yet this is the crucial question for infant day care projects to answer."

The Plan for the Utilization of Data in the Present Study

A substantial quantity of data related to emotional/personality development has been collected in the ongoing project involving group care of infants at the University of North Carolina at Greensboro. The Project was funded in 1967 to define and demonstrate quality group day care for infants and toddlers, and to demonstrate whether there are any deleterious effects of day care on infants. Infants in day care are partially separated from their mothers and inevitably encounter a number of different caregivers. This situation raises the question of whether such separation and such "multiple mothering" will have adverse effects on the young child.

The original research plan of the project research proposal (Keister, 1967) presented the basic problem of evaluation:

> . . . we do not know in which direction we should predict differences in behavior. We might think of the danger for the Center babies as focused in a lack of a close relationship with one mother, resulting in a sub-clinical hospitalism with signs of apathy

> and lack of initiative and curiosity. Or, conversely, we might suppose that the lack of such an intensive relationship would result in children with too few controls, children who were overly rebellious and independent. Our speculations have led us to believe that almost any behavioral deviancy in the Center infants could be explained by some set of concepts about the genesis of human behavior. The second problem raised by the existing literature is that since there are no agreed-upon relationships between behavior and "underlying personality," any behavioral deviance can be interpreted as good or bad. E.g., a child's leaving his mother easily may seem "good" if one believes that the systematic variable underlying the behavior is a sense of security. However, if one believes that such behavior reflects a superficial emotional relationship with the mother, one is likely to assign a value of "bad" to the behavior. Due to the lack of previous research in this area, we must restrict ourselves to such empirical variables as ease of leaving the mother; we do not plan to infer underlying personality disturbances (or strengths) prematurely. The wisest course seems to be to try to measure tasks related to expected development, and simply to ask whether or not there are differences between the "Center" babies and the "Home" babies (p. 31).

The present study was designed to collect and analyze data related to emotional/personality development which were obtained from a group of infants reared at home and a matched group of infants enrolled in the demonstration Day Care Center. The major concern was to identify any differences in the two groups of infants that might indicate adverse effects related to the fact that the Center infants spend eight hours or more per day, five days a week away from their own mothers.

Data were collected over time on two groups of infants, "Home" and "Center," in order to compare infants' reaction to strangers and infants' willingness to separate from their mothers and go to a

stranger, and to determine whether there is patterning in this type of behavior. Additional data from both "Home" and "Center" babies describing how a child reacts to his mother's leaving him were collected in an attempt to examine the relationship of the child's behavior in this situation and his reaction to a stranger at an earlier age and to determine whether any relationship exists between these two indices of attachment.

Performance on exploratory items contained in the mental test of the Bayley Scales of Infant Development administered to "Home" and "Center" children were used as an index of the quality of the child's attachment which enables him to use the mother as a secure base for exploration.

Problems in eating and sleeping routines are believed to reflect emotional states. One might suspect that infants who have to adjust to and cope with the anxiety and stress of being enrolled in day care (and cared for by some unfamiliar adult) would develop eating and sleeping problems. Data on eating and sleeping were collected from mothers in both groups to determine whether differences exist which could be a function of the day care experiences.

Clarification of Terms Used

'Group care'

'Group care' often refers to 24-hour care in an institutional or residential setting, such as a Children's Home or hospital, or in the Israli kibbutz pattern of child care. It is also used to describe out-of-home daytime care for a group of five or more children.

'Day care'

'Day care' usually means care during daytime hours outside the child's own home; it implies that the child "belongs" with his family and returns to his home by the end of the day (i.e., late afternoon) and spends weekends with his own family in his own home. Day care may be provided in a center or a home setting; the facility may be operated by a proprietor or be a part of a chain or franchise operation; it may be operated by an industry or business; it may receive support through state and/or federal funds, or through a community agency (e.g., a United Fund agency) with some controls exerted by the funding agency. In addition to providing services for parents and children, some day care facilities may have research and evaluation as a component of the total program; the majority do not. 'Day care' also connotes to many that some kind of intervention or educational component has been included in the program. This is understandable in view of heightened public awareness of the relationship between poverty and the lack of certain kinds of

intellectual achievement, particularly academic, with the subsequent trend being to begin "intervention" earlier and earlier. 'Day Care' does not by definition imply a program geared to stimulating cognitive development. The majority of programs emphasize care and protection of the child.

'Infant day care'

'Infant day care' is broadly defined as 'all-day care for infants and toddlers'. The age range will vary from facility to facility, but usually an infant-care facility is designed for children from two or three months of age up to three years of age.

'Quality infant day care'

The infant day care program from which the present study is derived was designed as a demonstration of a day care program of high quality, based on the model of warm, affectionate, individualized care comparable to that a baby would experience in his own home.

'Attachment'

'Attachment' is a term used to describe an affectional relationship between the infant and his mother; attachment is regarded as essential to healthy emotional/personality development.

'Attachment behaviors'

'Attachment behaviors' means those behaviors which are presumed to lead to the acquisition of attachment. Ainsworth (1964) defines attachment behavior as behavior "through which a discriminatory,

differential affectional relationship is established with a person or object ..." (p. 51). An infant's attachment behavior (e.g., crying) serves to keep the mother in close proximity to the infant.

'Exploratory behavior'

Exploratory behavior is behavior which can be described as searching, looking, examining, discovering, or investigating. In the present study this behavior is initiated by the subject in response to test situations of the Bayley Scales of Infant Development (Mental) and is necessary to performance, i.e., "to pass" the test item.

'Emotional/personality development'

Emotional/personality development is the development of characteristic behaviors, values, and attitudes by which individuals become unique. A child's emotional and personality development cannot be directly assessed, but it is believed that attachment, or the infant-mother relationship, is basic to this development. It is necessary to examine in this study indices of attachment and thus indirectly to assess emotional/personality development.

Hypotheses

Hypothesis I

There is no difference, between infants enrolled in a day care center and infants reared at home, in reactions to strangers.

Hypothesis II

There are relatively more negative reactions to strangers at ages 6 to 12 months and again at ages 24 to 30 months than at any other time in the age period of 2 months to 48 months. This is true for both Center and Home infants.

Hypothesis III

There is no difference between the Home and Center children in the correlations between two indices of attachment: infants' reactions to strangers during the second half of the first year of life and their reactions to being left by their mothers at age two and at later developmental stages.

Hypothesis IV

There is no difference, between infants enrolled in a day care center and infants reared at home, in performance on exploratory test items (on the Mental test of the Bayley Scales of Infant Development, Revised).

Hypothesis V

There is no difference in eating patterns and sleeping routines, as between Home and Center children.

CHAPTER II

REVIEW OF RELATED LITERATURE

Theoretical Evaluations of the Importance of Infant-Mother Relationships

Psychoanalytic literature has always stressed the importance of the development of the infant-mother relationship and has taken note of the presumed consequences of inadequate early relationships. The development and quality of the infant's relationship to his mother during his first year of life is believed by psychoanalysts to bear a direct relationship to the development of all later significant interpersonal relationships and to play an important role in the individual's growth and total development.

Not only psychoanalysts, but anthropologists, social learning, theorists, and ethologists as well have emphasized the importance of this relationship. Ainsworth (1969) reviewed the three major theoretical attempts to explain the development of the infant-mother relationship. They include psychoanalytic theories of object relations, social learning theories of dependency (and attachment), and an ethologically oriented theory of attachment. In addition to the three major theories, Maccoby and Masters (1970) listed three less extensive but important "subtheories" which attempt to explain specific aspects of attachment and dependency behaviors at certain ages.

The effects of interference with the infant-mother relationship have been investigated under such conceptual headings as maternal deprivation, maternal separation, separation anxiety, sensory deprivation, multiple mothering, and intermittent mothering. Spitz (1945) gave considerable attention to the concept of maternal deprivation effects, and Bowlby's monograph (1951) on the same topic had a profound impact, which is being felt even today in the realm of child care. The prevailing attitude among psychiatrists, pediatricians, social workers, and even laymen emphasizes the damaging effects of separating an infant from his mother and insists that in most instances there is no substitute for the care of an infant by his own mother. A practical and valuable outcome has been vast improvement in the institutional care of children and continued awareness and investigation of the needs of all infants.

Psychoanalytic/Ethological Theories

Researchers and clinicians continue to maintain an interest in this early relationship and have attempted to examine more thoroughly the significant variables which contribute to the development of what Bowlby (1958) termed the "nature of the child's tie to his mother," referring to this as "attachment," a term which represents a blend of ethological and psychoanalytic theory. Ethological, or instinct theory, describes attachment in terms of a class of behavior shared by all members of a species.

In addition to the theoretical attention to the question of how attachment develops, there is concern about the quality of the infant-mother relationship, and the possibility that there may be some critical period in the infant's development during which he must be in close contact with his mother in order for an attachment to be formed. There may be a period (or an age) during which separation may be more damaging than at other periods.

The onset of fear of strangers and of strange situations is cited as important evidence of the development of infant-mother attachment. Spitz, an ego psychologist, reported (1946) that "eight months anxiety" begins somewhere between the sixth and eighth month, being a product of the infant's increasing capacity for diacritic discrimination between friend and stranger. Response of the infant to the stranger may vary from "coy" to "bashful" behavior, to turning away, crying, and in some instances screaming and refusing to play with or accept a toy from the stranger.

Spitz (1959) viewed the emergence of the discrimination of strangers as the beginning of the stage of the libidinal object proper. When the child perceives that the stranger's face is different from that of his mother, he is capable of true object relations. Spitz (1965) further concluded that until the infant can distinguish his mother from all others, there is no libidinal object, and therefore no "love" until such a mother-infant libidinal bond emerges. Absence or separation of the mother and infant could produce serious disturbance in the development of this mother-infant libidinal bond.

Piaget (1954) stated that in the early months the infant cannot conceive of an object as a permanent, independent substance -- the infant behaves as though the object has ceased to exist when it is outside the immediate perceptual field. Although Piaget is concerned with the concept of object and the development of object permanence as it relates to cognitive development, the same interpretation holds for social objects, e.g., the mother, or any love-object.

Bowlby (1969) subscribes to object relations theory, which maintains that there are primitive object relations from the very beginning of infancy, and that the infant-mother tie is based on a number of species-characteristic behavioral systems which serve to keep the infant in close proximity to his mother, thus resulting in infant-mother attachment. In 1958, Bowlby cited five infant behavioral systems (crying, smiling, clinging, sucking, and following) which served to elicit or release caretaking responses from the mother and to keep the infant in close proximity to his mother. In his later writings Bowlby (1969) has introduced a control systems model which incorporates simple behavioral systems into a goal-corrected system.

Social Learning Theories

Some social learning theorists prefer the term "dependency" to describe the infant-mother relationship. The infant is dependent on his mother for nurturance and for the gratification of his physiological needs, or the reduction of his primary drives. The infant's behaviors are reinforced by his mother's responses to his needs, and in the course of her close contact with the infant, other stimuli provided by the mother (her voice, her patting, her face) are also reinforcing to the infant. The infant acquires a secondary dependency drive -- to be close to his mother and to want her care and attention.

Beller (1955), Bandura and Walters (1963), Dollard and Miller (1950), and Sears (1963) are among those who view dependency as a drive acquired by the infant in the course of his mother's nurturance of him.

Other social learning theorists disagree with the concept of dependency as a drive, and reserve the term dependency for particular kinds of learned behavior.

Gewirtz (1961) and Bijou and Baer (1965) are among those who adopt an operant conditioning model in which emphasis is on the contingency between the infant's responses and reinforcement provided by the mother. The infant's behavior is shaped by reinforcers from the mother, and at the same time the mother's behavior is shaped by reinforcers the infant provides her.

Although there is a great deal of uniformity in infant behavior, social learning theory focuses more on individual differences and explains different kinds of dependency behaviors in terms of the particular contingencies and reinforcers in a given child's history.

Concern for Infants as Result of Empirical Evidence

Bowlby (1951, 1958, 1969) has steadfastly maintained that the bases of both mental health and mental ill health are to be found in the experience the infant and young child have in relation to the mother. A classic work by Ribble (1944) emphasized the crucial nature of the infant's need for mothering.

Freud and Burlingham (1944) studied young children placed in residential nurseries in England, refugees from Europe during World War II. They reported that the child in residential care makes appropriate gains only if he has a close relationship or attachment to one caregiver or adult on the nursery staff.

Spitz (1945) and Spitz and Wolf (1946) are associated with the identification of hospitalism and anaclitic depression, two psychiatric syndromes of depression which were observed in institutionalized infants who had been separated from their mothers. Although the babies received adequate physical care, these depressive states, or grief reactions, were accompanied by severe developmental lags, intellectual retardation, behavior that resembled adult psychotic symptoms; in some instances, the babies

became physically run down, were subject to infection, or even died. The effects of separation were reported to be most severe when separation occurred in the second half of the baby's first year.

Studies of mother-infant separation effects and maternal deprivation effects have been criticized for their poor experimental design, lack of controls, and lack of sufficient empirical evidence. Later interpretations of these effects suggest that in many earlier studies lack of mothering was compounded by reduced overall social contact and sheer stimulus deprivation.

Casler (1961) and Yarrow (1964) published comprehensive reviews of the literature on maternal deprivation. The studies reviewed demonstrate forcibly that children need social contact, sensory stimulation, and consistent care by a "mothering figure." As a consequence of these findings there have been changes in child-care practices. There has been a shift from institutionalized foundling homes to foster home care and earlier placement in adoptive homes. Hospital pediatric care today includes arrangements for mothers to be with their babies as much as possible if the babies require hospitalization, and provides more emotional support and substitute mothering in those instances when a very young child must be separated from his mother.

Research on Infant Day Care

Swift (1964) reviewed the effects of early group experience and differentiated between the institutions of nursery school, which developed from the fields of child development and education, and of day nursery, which developed from the welfare field. The former is essentially an educational supplement to the home experience of the child; the latter involves a longer day and is a substitute for maternal care, in many instances while the mother works. Most of the studies reviewed pertained to nursery schools rather than day nurseries and did not involve infants and very young children. (Those studies which report on the effects of day nursery experience on very young children are included in a later section of this chapter.)

Mead (1962) pointed out that the concept of the necessary single mother-figure as the primary caregiver of an infant is a culture-bound assumption. In many cultures multiple-mothering is the accepted practice, and she suggested that children reared in these cultures grow up trusting more people, better able to cope with separation, and presumably adequate in interpersonal relationships.

A comprehensive cross-indexed bibliography of research on infancy edited by Brackbill (1964) lists 1733 research references. Inspection reveals, however, that only a few report on group infant care with these generally limited to hospital settings.

Siegel (1967) in an editorial comment in Child Development (journal of the Society for Research in Child Development) pointed out that in the years 1965-1966, Child Development did not publish a single study concentrating on very young children (one to three years of age) and that only 15 of 152 published studies with human subjects involved infants six days to one year of age. An examination by the present investigator of the 1969-1970 issues of this journal showed no change in this "trend." It is interesting to note, in view of the current interest in group day care for infants, that the past two years have not produced, in this journal at least, a single research study or report on infants and toddlers in group settings.

Howard (1970), as Director of the Research Utilization and Information Sharing Project for the Cyesis Programs Consortium (Washington, D. C.), undertook to survey group infant care programs in this country and produced a preliminary report in October 1970. The survey provided rather detailed information on 59 group infant care programs existing in the United States in mid-1970. (This was not the total of all such programs, as no proprietary centers were sampled. The survey questionnaire was sent to 117 organizations and individuals thought to be operating group infant care programs. Facilities caring for infants on a residential basis were not surveyed. A high rate of return on the questionnaire was reported.) Of the 59 programs reporting, 10 were research and demonstration programs, 22 were pilot programs, and 27 were defined as ongoing services. The survey also gathered information,not only on the 59 programs in operation, but on 29 group infant care programs being

planned for the fall of 1970 -- seven research and demonstration programs, five pilot programs, and 17 ongoing service programs. Twenty of these 29 new programs for group care were for the infants of school girls.

The descriptions of the programs surveyed indicated that many babies were in group care as participants in university and research institute programs. Some were enrolled because their mothers were working outside the home; some were enrolled in programs of preventive health care and compensatory experiences where there was evidence of deprived home environments. Many of the programs were providing continuing education for pregnant school-age mothers with provisions also for their babies, while others emphasized working with parents and infants to offset "disadvantaged" effects.

From some of the demonstration and research projects in this country preliminary reports are available, although not, as yet, any published "final results" of the effects of group care on very young children. Most preliminary reports are available from ongoing programs in mimeographed form. Many of the programs have been in operation for a relatively short period of time, and directors and researchers maintain that they are being pressured prematurely for "findings." Consequently, to organize a review of the literature on research on infants in all-day group care appears to be somewhat premature.

Research Outside the United States

Countries outside the United States have had more enthusiasm for and more extensive programs of day care for infants and very young children than has been the case in the United States. Reports of visits to centers in other countries, reviews of the literature describing programs in other countries, and comments by professionals visiting the United States, constitute the basic source of information about theory and practice in countries other than our own.

Evaluation of the research in other countries is handicapped by differing philosophies and ideologies related to child rearing. This problem is further complicated by the different manner in which western and eastern scientific research is reported. Meers and Marans (1968) prepared a comprehensive review of group care of infants in other countries, including information on the children's collectives in the U.S.S.R., the child care programs of East Germany, Czechoslovakia and Hungary, the Metara Babies Center in Greece, the creches of France, and the kibbutz method of child-rearing in Israel. This report deals more with programs, however, than with any specific research studies or assessments of effects of different child care practices.

The World Health Organization published a study of infants in day care in Poland. Gornicki (1964) compared children in day care with children in home care, the infants in the two groups coming from families of similar socio-economic and educational levels. The study covered 900 children, 500 of whom were "home" children, and 400

of whom were "day-nursery" children, divided into eight age groups, 9, 12, 15, 18, 21, 30, and 36 months. He concluded that the environment of a well-organized day care center does not markedly retard the child's psychomotor development, or, in the majority of children, cause behavior disorders or particular difficulties other than those found in children of the same age reared in their own homes.

Studies of Attachment

In studies of attachment there are two situations which are frequently observed. In one situation the infant separates himself (moves away) from his mother, and he has some control over how far away he moves and how long he stays away before moving back to her; for example, he may venture away from his mother in the direction of a new toy that has been placed some distance away from him. In the other situation the mother separates herself from the infant, and she is in control of time and space involved in the separation. In studies involving fear of strangers and strange situations, the amount of anxiety, stress or fear shown by the child is observed as well as the proximity of the infant to the mother, the amount of exploratory behavior displayed, the child's willingness to separate from his mother and to go to a stranger, and differences in the amount of stress with mother present and with mother absent.

Maccoby and Masters (1970) reported that in a situation in which a young child is described as afraid, anxious, or experiencing stress, this description usually is derived from the nature of the arousing stimulus or from the child's emotional behavior. Studies of the relationship between fear and attachment behavior have focused upon two issues: first, the role of fear in arousing or intensifying attachment behavior (e.g., clinging, crying, rocking, etc.) and second, the role of attachment behavior in reducing fear or permitting the child to cope with emotional tension.

Harlow and Harlow (1966) reported that an infant monkey exhibits terrorized behavior in relation to an object in a strange situation with his surrogate mother absent, whereas the presence of the mother, surrogate or real, will facilitate exploration of animate and inanimate objects in the identical situation. The infant returns from time to time to the mother for contact, comfort, and reassurance.

Hinde and Spencer-Booth (1971) studied the effects on Rhesus monkeys of brief separation from mother. They found that the effects of removing the mother for a period of six days were dramatic. The infants called a great deal at first and then showed depressed locomotor and play activity. In some infants these symptoms persisted for a month after the mother's return. The infants who had only a six-day separation experience had less depression of activity and recovered from it more rapidly, were more active when active, and made fewer distress calls than infants who had two six-day

separation experiences or one 13-day separation. The severity of the effects were quantitatively related to the length of separation. The infants showed marked individual variability in reaction to separation; males showed a higher mean distress index during and after separation than females (measures before separation did not differ significantly). The age of the infant studied and amount of contact with group companions appeared to be of minor importance.

Amount of distress was related to certain aspects of the mother-infant relationship. There was some tendency for those infants that were most distressed (prior to separation) to be off from their mothers least and to maintain closer proximity, but more conspicuous were the tendencies for those with a high distress index to be the infants rejected most by their mothers and those that played the greatest relative role in maintaining proximity with her.

When compared with a control group five months later, the experimental infants who had experienced a six-day separation from their mothers were conspicuously less ready to approach strange objects in a strange cage even with their mothers in an adjoining cage. Differences between controls and experimentals were more marked with the infants who had had two separation experiences. When tested at 30 months (two years after the separation experience) the differences were much less marked, but the previously separated infants were still less active than the controls.

The investigators found that in the development of the infant-mother relationship the mother played the larger role in promoting the infants' independence. The proximity of infant to mother appeared to be primarily a function of the mothers' behavior. (Most attachment theorists stress the role of infants' attachment behaviors -- e.g., following, clinging, etc. -- in maintaining proximity, and thereby affecting the infant-mother relationship.)

Shirley (1942) studied children's adjustments to a strange situation, her subjects ranging in age from two to six years. She found that compared with children in the age range from two to six years, children at age three years were less likely to make good adjustment to the initial experience of coming to a center for a full day to undergo a number of medical examinations and to spend a part of the day in a typical nursery school. Children at age two-and-a-half years adjusted better, presumably because they experienced little anticipatory dread, while the three year old child's opportunity for more experience with unfamiliar situations made him more apprehensive.

Arsenian (1943) studied 24 children, ages 11 to 30 months, in an insecure situation, in a state reformatory nursery school. One group was left alone in an unfamiliar but attractive room with interesting toys;another group was placed in the same situation by their mothers (or a familiar adult) who remained with them. Their behaviors were observed and rated on a security-insecurity basis. The security ratings were lower for the alone group than for the group with the familiar adults. The most secure group were the children with their mothers. Some who had been with their mothers were left

alone on the fifth trial and their security rating decreased sharply. Children who had been alone did not show an increase in security ratings when a familiar adult stayed with them on the fifth trial.

Ainsworth and Wittig (1967) observed the behavior of 14 normal one year old infants in a strange situation in a series of three minute episodes in which the child was alone, with his mother, with a stranger, or with mother and stranger. The most exploratory/play behavior occurred when the child was with his mother; the amount of crying was greater when the child was alone or with the stranger. When the stranger was present with the mother, however, some of the children approached the stranger and most did not object to being approached by the stranger. There are some confounding effects as the episodes were not counterbalanced. For example, in the first episode the mother left her baby with a stranger and went out of the room; in the second, she left her baby alone; in the third, the stranger entered and tried to comfort the infant if he was upset, and in the next episode the mother reappeared. There may have been cumulative effects of successive separations.

Ainsworth (1964) reported that Baganda infants' most striking evidences of clinging behavior in the first year of life were associated with fright due to the fear-arousing stimulus of a stranger. If the infant was in his mother's arms the baby would cling. If his mother tried to hand him to a stranger he screamed and clung. Panicky clinging in response to strangers was not evidenced in a child younger than 40 weeks. Fear of strangers appeared as early as eight months with some babies.

Some investigators observe that it is difficult for a child to separate from his attachment object (his mother), and after separation, when the infant is reunited with his mother, an enhanced intensity of attachment behavior is shown. Schaffer and Callender (1956) found that infants seven months old or older were more upset as a result of short-term hospitalization than younger infants. They also showed more intensity of attachment behaviors when reunited with their mothers. They cried more if their mothers left them, showed more clinging behavior, and showed greater fear when they were approached by strangers and also when approached by other family members.

Schaffer (1966) reported on a sample of 36 normal infants (18 boys and 18 girls) in which initial contacts by a female investigator were made with infants varying from 6 to 14 weeks of age and thereafter at regular four-week intervals until the end of the first year and again at 18 months. In the testing sessions the mother stood just by the infant. The investigator, or "stranger," related to the infant in a series of six steps involving progressively greater proximity. From the data collected on this fear of stranger measure, results showed that the mean age at onset of fear of strangers was 35.94 weeks, or roughly at eight months of age, although there was a wide range of individual differences. There was a tendency for boys to reach the onset of this type of behavior somewhat earlier than girls. First born children in the sample were considerably younger at showing fear of strangers than later born children. It was reported that the onset of fear of strangers was often sudden and dramatic and was observed in all 36 children.

G. Bronson (1971) observed 32 babies at ages 3, 4, 6 1/2, and 9 months in their own homes, noting their reactions to the standardized approach of a male stranger. Since the consensus of previous studies placed the onset of fear of strangers within the second six months of life, Bronson reported surprise at the frequency with which babies three and four months old reacted to his approach by signs of uneasiness. He interpreted the long unsmiling attention given to the stranger's face at this age as a slow processing of perceptual input when infants are just beginning to manage the distinction between a familiar and unfamiliar face. In the second half-year of life, discrimination was almost immediate and at six-and-one-half months some degree of visual avoidance usually occurred. He proposed that the early reaction was a certain "wariness," while later reactions were "fear reactions." He suggested that if the traditional learning processes effect a transition from the earlier stage to the later stage, the important variable related to this transition may prove to be not repeated early exposures to a variety of unfamiliar persons, but rather to be the quality of the encounters.

Glass (1949) studied a group of children two to five years of age, whose mothers worked and who attended a day nursery from 6 1/2 to 10 1/2 hours daily. This group was compared with a control group of children cared for at home by their mothers. Findings suggested only slight differences between the two groups with respect to eating, sleeping, and elimination habits, and with respect to the incidence

of problem children, i.e., children showing either one marked habit disturbance, or a habit disturbance associated with a personality or behavior difficulty. Since over half of the day nursery group entered before the age of two, these findings were interpreted as indicating that day nursery care at age two is not harmful.

Heinicke (1956) compared the behavior of two groups of two year old children during the period of their first separation from their parents. One group consisted of three girls and three boys drawn from three residential nurseries. The other group consisted of three girls and four boys drawn from three different rooms of one day nursery. Responses of the residential group were more intense and extreme; their seeking of parents was accompanied by crying; their seeking of relations with staff was of a very demanding sort; hostile expressions were more severe; there were more autoerotic activities, and a greater degree of breakdown in such areas as sphincter control and illness. During the separation period of three weeks, when parents visited the residential children, some of these children refused to recognize the parents. The day nursery children also sought their parents and substituted relations with staff, but did so in a less urgent way. They devoted a greater proportion of their time to neutral play. They arrived between 8:00 and 8:30 a.m., and they went home at 5:00 p.m. Relations to their parents when they returned in the afternoon were appropriate.

Rheingold (1961) reported that a group of home-reared infants, approximately 3 1/2 months old, showed more "negative" reactions to a stranger than a group of institutional babies the same age who had had a variety of caretakers. Rheingold suggested two possible interpretations: (1) the institutional babies' more positive responses to a stranger may be a result of social deprivation effects, or (2) it may be that home-reared babies show fear of strangers at an earlier age.

Tennes and Lampl (1964) also presented data indicating that wariness of strangers was present in about one-half of their sample of three- to four-month old infants.

W. C. Bronson (1971), in a study of exploratory behavior of 15 month old infants, found that exploratory activities tended to decrease in the presence of a silent stranger. The intensity of attention directed to a friendly stranger differed little from what it was when the stranger was silent; and the infants' behavior in the presence of the friendly stranger was indistinguishable from their behavior when only the mother and object (a novel object designed to arouse the infants' curiosity and exploratory behavior) were present. She described the babies' regard of the silent stranger as mainly neutral. Also, there were distinct differences in responses of boy and girl babies to the field presented them in the episodes of the novel situation.

In a symposium on attachment behavior, Salapatek (1971) pointed out inconsistencies among data from three studies. For example, Lewis and Ban (1971) studied stability of attachment and reported few sex differences at one year, but definite differences by the second year in proximal, distal, touching, and looking behaviors. That proximal behaviors are transformed into distal behaviors was only weakly supported by the data. What seemed clear was that there were important individual differences in patterning, particularly with respect to sex. They reported that across the age period 12 to 24 months in a free play situation, 1) touching remained constant for boys but decreased for girls; 2) proximity remained stable for girls, but increased for boys; 3) vocalization declined for both sexes; and 4) looking increased for both sexes. Coates, Anderson, and Hartup (1971) reported that, in general, proximity, touch, vocalizing, looking, and crying under non-separation, separation, and reunion situations were relatively constant in frequency across 10, 14, and 18 months of age. Sex in no way interacted with these results. Maccoby (1971) reported that during free play over the third year (24 to 36 months), 1) younger children stayed closer to their mothers than older children; 2) vocalization, smiling, and showing increased with age; and 3) looking remained constant. There were no sex differences reported in measures of attachment to the mother, but there was a sex difference in positive orientation toward a stranger. At each age level, 2, 2 1/2, and 3 years, girls were more likely to smile at, look at, and talk to the stranger. At age two, there was a sex

difference in activity, with boys running around the room more. At age two in the episode in which mother left the child alone, boys were more likely to bang upon the door, struggle with it, and get it open than were the girls.

The data in the Lewis and Ban (1971) study were obtained with the child in an attractive playroom containing simple toys with the mother present. In the Coates et al. (1971) study, data were obtained by time sampling in six-second periods, with the presence or absence of the four behaviors, visual regard, vocalizing, touching, and proximity checked for non-separation sessions (consisting of ten minutes with mother present) and separation (consisting of three minutes of mother present, followed by two minutes in which the mother left the infant alone, and two minutes of reunion). In the Maccoby (1971) study the data were derived from observation of each child in a series of episodes or "strange situations." During a free play period before the stranger entered and while the mother was present, younger children stayed closer to the mothers than did older children. When the stranger entered, children at all three ages went closer to their mothers, and at all three ages with the stranger present there was less interaction with the mother. The younger the child, the more likely he was to be upset when alone or left with the stranger. In the episode in which the two-year-olds were left alone, for both sexes the amount of manipulative play with toys declined markedly, the subjects showing distress and remaining near the door.

Maccoby (1971) reported some stability over time in attachment behaviors. The children who cried at age 2 years when their mothers left were the children who did so also at ages 2 1/2 and 3, although total frequency and duration of crying during protest declined with age. Going close to the mother when the stranger entered seemed to be characteristic of individual children, and predictable from age 2 or 2 1/2 to age 3. Crying when the mother left the child with the stranger was more stable across ages than crying when the child was left alone. A tendency to avoid the stranger or to interact with the stranger was also a stable characteristic for the same child, which suggested that individual differences in fear of strangers may be the stable characteristic that was observed and not a stable individual difference in degree of attachment to the mother. There was no sign of transformation of shift from proximal to distal forms of attachment behavior with age. The children in the study who showed the most mature forms of attachment behavior at age 2 were more likely to show immature forms at age 2 1/2 and 3. This finding is contrary to the hypothesis of proximal-to-distal shift in attachment behaviors, according to which the child who shows a high level of proximal attachment behavior at a younger age should be the child who shows unusually high levels of distal attachment behavior when he is older.

Maccoby (1971) also examined the relationships between the children's behavior in the observational situation and later nursery school behavior. A multiple regression analysis resulted in no predictiveness of the child's reaction to his mother in the nursery setting, but orientation to teachers, adults, and to peers was predictable on the basis of the child's earlier behavior in separation and non-separation conditions.

Bell (1970), in a study of 26 infants, reported that babies who cry little in the fourth quarter of the first year and who develop other means of communication with their mothers are the ones whose mothers have promptly heeded their cries throughout the first year of life. In an interactional mother-infant dyad, the mother's responsive role produces an adaptive outcome in that eventually the child cries less and less, reserving crying for the more alarming conditions. This in turn facilitates the mother's protective role.

Stayton (1970), in a study of infant-mother interactions, concluded that sensitive mothering fosters a secure attachment between the infant and his mother. She viewed this finding as lending support to the thesis that the intensity and patterning of behaviors that an infant uses to express his attachment to his mother shows a great deal about his feelings of security and insecurity.

Rheingold and Eckerman (1971) have challenged the categorical statement that infants fear a stranger in the second half of the first year of life. Twenty-four normal home-reared infants were tested, eight each at 8, 10, and 12 months of age, evenly divided by sex. In a series of testing situations with mother present and a

stranger in close proximity, most of the babies did not cry or fuss, all played with toys, most smiled promptly and often. Thirteen out of seventeen infants allowed the mother to leave the room after the infant had been held for two minutes, and they remained in the stranger's arms another two minutes without crying. In this unfamiliar setting infant responses to one of two female strangers were generally accepting and friendly with scarcely any evidence of fear or anxiety.

Need for Research

Much of the research on attachment behavior has produced inconsistent findings. There appears to be little evidence for behavioral stability or predictability. Part of the problem may be due to the varying conditions of measurement and the inference that the behavior measured is indicative of attachment when in fact it may be related primarily to conditions of stress. Lewis and Ban (1971) suggested that the degree of the infant's distress at his mother's leaving may not be a true indicator of attachment. What may be measured is distress at the momentary experience of separation, as, e.g., the baby sitter usually reports that minutes later after the mother leaves the child becomes cheerful and "has a perfectly wonderful time."

It is still important, however unclear the measure of attachment may be, to determine whether there are differences in children who are reared at home and children who have a number of caregivers away from home. Does day care tend to dilute the infant's

attachment to his own mother, so that his behavior is different in stressful and strange situations from the behavior of infants reared at home?

Caldwell, Wright, Honig, and Tannenbaum (1970) reported that a group of home-reared children and a group of children who had been enrolled in an infant day care center were examined at 30 months of age for differences in child-mother and mother-child attachment patterns. Data were secured from interviews with the mothers, a home visit, and developmental tests administered to the subjects at age one year. (The interviewer and rater knew whether each mother-child dyad belonged to the home or day care sample.) Attachment was operationally defined as involving the behavior characteristics sampled in the maternal interviews and rated on seven scales: affiliation, nurturance, hostility, permissiveness, dependency, happiness, and emotionality. Essentially no difference between the groups could be detected in the attachment patterns. No babies in this study had entered the program before six months of age, and most had entered around one year of age.

Ainsworth (1967) has stated that there is no evidence that care by several people necessarily interferes with the development of healthy attachment. It is necessary, however, that research provide more conclusive evidence about the effects on the development of attachment of all day care and of multiple caregivers.

It remains important to examine as many aspects of behavior as possible which are believed to be related to emotional and personality development in infancy and to attempt to determine whether there are behavioral differences in infants that might be a function of their having been reared differently, i.e., reared in their own homes by their own mothers, or cared for during the daytime in a day care center. The present study presents data to help answer some of these questions.

CHAPTER III

METHOD AND RESULTS

Design of the Demonstration Project

A "Demonstration Project: Group Care of Infants" was initiated at the University of North Carolina at Greensboro in 1967, under the direction of Dr. Mary Elizabeth Keister. The purpose of the evaluative aspect of the project was to determine whether or not there were any deleterious effects on infants of all day care in a group situation. Measures were obtained on global aspects of infant behavior -- physical, mental, motor and social development, and physical health -- which have been reported to be adversely affected by group care in infancy.

The basic design involved repeated measures on a sample of matched pairs of subjects in an experimental (Center) and a control (Home) group of infants in the Demonstration Project. Fifteen pairs of infants were matched on sex, race, age at entering the project, age and education of parents, socio-economic status (all were from middle-income homes), and (somewhat less exactly) on birth order. (Children from middle class homes were chosen to provide a comparison group that could be considered "advantaged" or "stimulated;" otherwise it might have been easy to demonstrate that babies in a quality group program developed as satisfactorily as babies in "disadvantaged" or "deprived" home environments.) Infants enrolled

in a program of all-day care in a Nursery Center were matched on these variables with infants being reared at home by their own mothers.

The null hypothesis that there would be no difference between the Center and Home groups was postulated for each of the measures: physical, mental, motor and social development, and physical health.

The following is a statement from the Final Report (Keister, 1970a) citing results from testing the two groups over a period of three years:

> In 15 pairs of matched Home and Center children (from middle class families) between the ages of three months and three years, few significant differences were found between the groups on mental, motor, or social development. Those differences which were significant favored the Center children; the absolute values of the mean differences were small. Height and weight measures have not been analyzed statistically, but inspection of the data suggests that the small differences which exist, if found to be significant, will show the Home children to be shorter and heavier. Illness data were difficult to collect, but the Center children appear to have had significantly more illness. The only individual symptoms which were found to be significantly different were Diaper Rash and Cold/Runny Nose (p. 54).

Basic Research Question for the Present Study

A basic concern of the Demonstration Project was the evaluation of the effects of day care on infants' emotional and personality development. Admittedly this is an area, particularly in infancy, which does not lend itself easily to measurement. A number of additional features were incorporated into the overall study in an attempt to conceptualize and to analyze differences that might occur in the two groups. Each of these will be reported separately as indices

of emotional/personality development. They include for both "Home" and "Center" infants:

(a) a study of infants' reactions to strangers in "a miniature real life situation" in which a stranger (one of the testers), holding an attractive toy, attempts to get an infant to leave his mother and approach the tester; data were derived from observations recorded quarterly up to age 12 months and semi-annually therafter;

(b) a study of mothers' reports of how their infants react when they separate themselves from the infants, i.e., how infants react when they are left with a stranger (or babysitter); mothers' reports were obtained from a questionnaire;

(c) a study of infants' performance on exploratory test items of the mental test of the Bayley Scales of Infant Development administered quarterly up to the age of 12 months and semi-annually thereafter; and

(d) a study of eating patterns and sleeping routines; data were derived from monthly telephone interviews with mothers.

The Sample

In order to recruit infants and families for the Nursery Center and Home study, an announcement was sent to all faculty and staff in the five institutions of higher education in Greensboro. The announcement invited two groups of parents of children under two years of age to apply to participate in a demonstration project to be carried out over a five-year period. Parents were invited to apply who would like to arrange all-day care for their babies in the facilities of the Demonstration Nursery Center (which was described in an enclosed brochure accompanying the announcement). A second group of parents was invited to apply if they preferred to keep their babies at home in the care of their mothers or some other caretaker and would like to participate with the University in a study of their babies' development.

Demographic information was secured which was used to match the infants from the two groups. Matching was based on demographic data alone and not on test scores.

The sample consisted of 15 pairs of matched subjects. Fifteen infants in the experimental (Center) group were matched with 15 infants in the control (Home) group on sex, race, age at entering the project, age and education of parents, and somewhat less exactly on birth order. All were from middle-income homes.

The matched pairs included six pairs of white male infants, one pair of black male infants, five pairs of white female infants, and three pairs of black female infants.

Four pairs entered at age three months, four pairs at age six months, one pair at age nine months, three pairs at 13 months, one pair at 20 months, and two pairs at 24 months. Ten pairs were first-born infants.

Home mothers' mean age at subjects' birth was 27.9; Center mothers' mean age at subjects' birth was 25.9. Home fathers' mean age at subjects' birth was 33.9; Center fathers'mean age at subjects' birth was 29.6. Home mothers' mean educational level was 15.3 years of schooling; Center mothers', 16.4 years. Home fathers' mean educational level was 17.6 years of schooling; Center fathers' 16.7 years. These demographic characteristics are summarized in Table 1.

Data obtained from the matched sample described above were used to insure rigorous statistical analysis. The matching of subjects to reduce error in experimental comparisons is an important method of increasing the precision of a design (Ray, 1960). Matching of subjects on selective variables reduces error due to heterogeneity of subjects and increases the possibility that any differences found between the matched groups is due to experimental, or treatment, effects. The treatment in this instance is the experimental condition of Center care versus the control condition of Home care.

There were additional subjects in the project who were not matched. Data obtained on these Home and Center subjects have been combined with data on the matched sample in instances where pooling of data would help to answer additional questions without doing violence to rigorous research design.

Table 1

Demographic Characteristics of the Matched Sample

	HOME BABIES	CENTER BABIES
SEX		
Males	7	7
Females	8	8
RACE		
White	11	11
Black	4	4
MOTHER'S AGE		
Mean Age at Infant's Birth	27.9	25.9
FATHER'S AGE		
Mean Age at Infant's Birth	33.9	29.6
MOTHER'S EDUCATION		
Mean Years of Schooling	15.3	16.4
FATHER'S EDUCATION		
Mean Years of Schooling	17.6	16.7
SOCIAL CLASS		
Middle	15	15
PARENTS IN HOUSEHOLD		
Two	15	15

(N = 30)

It will be clear in each analysis as to whether the sample being used is the matched sample (consisting of 15 Home and 15 Center infants, N = 30) or whether the sample has been extended to include 27 additional infants (seven reared at Home and 20 enrolled at the Center) who were in the project but not matched, for a total of 57 subjects. The seven additional Home infants included two white males, four white females, and one black male. The 20 additional Center infants included four white males, five white females, seven black males, and four black females.

Specific Procedures and Analyses of Data

Part I. Reaction to Stranger

Rationale. Dr. Boyd McCandless, psychologist who served as a consultant for the Demonstration Project, suggested an experimental situation for the measurement of reaction to strangers. A "miniature real life situation" with high face validity was designed to yield data on how an infant reacts in a situation in which a stranger (the tester), holding an attractive toy, attempts to get the infant to leave his mother and approach the tester.

It is generally believed that a child who has a good attachment to his mother begins in the second half year of life (somewhere around the age of six months) to discriminate familiar faces from unfamiliar ones and to react negatively and fearfully to the unfamiliar or strange persons.

If the infant-mother relationship (or attachment) had been diluted in the case of the Center infants or had failed to develop as a result of their having spent eight hours a day, five days a week, away from their own mothers, one could hypothesize that Center infants' reactions to strangers would be less pronounced or somehow different from those of infants reared at home with their own mothers. The null hypothesis of no difference between Center and Home infants was adopted for evaluation.

The Design. On entering the home, the tester/examiner, who conducted the interview regarding social development, tried to entice the child to leave his mother to come to her. The tester was holding an attractive toy. She was instructed to observe the child's reaction, his willingness to come to her or his tendency to go closer to the mother, to note any facial or vocal expressions that might be indicative of fear, and particularly to note whether she felt he perceived her as a stranger.

Immediately after the interview was completed, the tester recorded on the face sheet of the PAR-Vineland interview form a narrative account of the child's reactions in the above described situation. The tester was aware of whether or not a child was a Center child or a Home child, but she was not given the rationale for the inclusion of this measurement other than for its interest at face value.

Two other conditions were specified. All testing was done in the child's own home with the mother present, and all test sessions were scheduled at a time when the child was not sick and at an hour designated by the mother as the time the child was most likely to be "at his best."

Both Home and Center children were interviewed by the same tester and there were repeated observations in this experimental situation every three months up to the age of 12 months and at six month intervals thereafter up to age four years. There is very little evidence about memory function in infancy, but Levy (1960) suggests that it is unlikely that memory is sufficiently well developed in the first year to bridge even a four-week gap, so it seems certain that there would be no familiarization affect over a three-month interval. It is unlikely that such a brief encounter would produce a familiarization effect that would span an interval of six months in the slightly older child. In any event, the tester had the same degree of strangeness for the infants in both "Center" and "Home."

In many research studies of reactions to strangers and/or strange situations, it is difficult to determine whether the behavior manifested by the infant is indicative of fear of, or response to, a "stranger" or "strangeness;" or whether his behavior is a manifestation of the aggression, distress, or disappointment he experiences due to his mother's departure or absence. In those situations in which the mother separates herself from the infant, the infant's behavior that

is inferred to be resistance to or fear of the stranger may in fact be resistance to his mother's leaving and distress at the prospect of separation.

In the present study this problem was eliminated, as every child was observed in his own home with his mother always present, and she made no attempt to leave him. Any reactions -- proximity-seeking or proximity-avoiding -- of the stranger by the infant was not confounded by the mother's leaving. Additional confounding of error was avoided as there was no strangeness in the home situation as compared to a laboratory setting. Thus, the infant's reaction to the stranger was not intensified by other anxiety-provoking aspects often encountered in experimental situations.

Measures. The present investigator, in collaboration with Dr. Frances Dunham, Research Director for the demonstration project, developed a rating scale for the evaluation of the narrative accounts of the infants' reaction to a stranger. A four-point Reaction to Stranger Rating Scale was developed (see Appendix B), with a rating of 1, equivalent to the infant's showing no objection to leaving his mother to come to the examiner, to a rating of 4, which reports strong protest and refusal to come to the stranger.

The reaction to stranger data were rated independently by the investigator and another doctoral candidate in child development who had previous clinical experience as a psychiatric social worker. For a total of 301 repeated measures on the combined total sample

(matched and unmatched subjects), the two scorers were in agreement in 87 percent of the cases, with a Pearson product-moment correlation coefficient of .88. The data were coded so that the raters did not know whether the observation applied to a Home or a Center child. This was true in all aspects of the study.

Wherever there was difference of agreement in scores by the two raters, for the actual data analysis, the scores were combined and the mean score was used to increase reliability. (This procedure increased the scale to a sevenpoint scale of continuous data -- 1, 1.5, 2, 2.5, 3, 3.5, and 4.)

Analysis of Data. Means and standard deviations at each age were computed for the two matched groups, Home and Center (Table 2). A preliminary examination of the results indicated that there was little or no difference in the two groups in their reactions to strangers. The immediate finding that was most surprising, however, was the failure of the mean score at any age for either group to exceed 2.32 (Table 2). A score of 2 meant that the child could be described as "seemed aware of the examiner as stranger; seemed hesitant (as suggested by any mild, qualitative comment, e.g., 'somewhat') but came to the examiner without protest. The anticipated "peak reaction" indicative of fear or strong protest was not observed at any age in either group.

Table 2

Scores from Ratings of Observational Data on Reaction to Stranger for Matched Sample

Age in Months	Home			Center		
	N	Mean	Standard Deviation	N	Mean	Standard Deviation
3	4	1.00	.00	4	1.00	.00
6	7	1.21	.39	7	1.21	.39
9	8	1.38	.52	8	1.44	.42
12	12	2.04	1.20	12	1.88	.71
18	11	2.32	.90	11	1.86	.84
24	11	1.41	.66	11	1.86	.74
30	10	1.65	.63	10	1.40	.66
36	6	1.50	.55	6	2.08	1.02
42	5	1.50	.71	5	1.00	.00
48	4	1.25	.50	4	1.00	.00

N = 15
Observations = 78 Home; 78 Center

Even though the differences between the scores for the two groups appeared to be very slight, the data were submitted to statistical analysis. For each matched pair the following reaction to stranger difference scores were computed: initial score difference, final score difference, mean score difference, and slope difference. (The slope was computed to compare changes in scores as a function of changes in age.) A multiple analysis of variance was performed on these four differences for 15 matched pairs. Table 3 contains means, difference means and standard deviations, univariate and multivariate Fs, and significance levels.

Results. The mean differences in initial, final and mean scores, and slopes were not significantly different from zero, as indicated by the univariate F values and their corresponding significance levels. The multivariate F (the vector consisting of all four values) was also not significant.

There was no basis for rejecting the null hypothesis that there is no difference in reaction to a stranger between infants enrolled in a day care center and infants reared at home.

Score differences for each pair were computed by subtracting the Center child's score from that of his matched Home control. The slight negative mean differences favor the Center, i.e., higher mean scores for the Center children were obtained.

Table 3

Analysis of Matched Sample Data for
Reaction to Stranger

Multiple Analysis of Variance

N	Group	Initial Scores Mean	Initial Scores S.D.	Final Scores Mean	Final Scores S.D.	Mean Scores Mean	Mean Scores S.D.	Slopes Mean	Slopes S.D.
15	Home	1.30		1.57		1.591		.0232	
15	Center	1.27		1.47		1.599		.0329	
Pairs 15	Mean Difference	.03	.99	.10	.74	-.008	.498	-.0097	.107
Univariate (1, 14 df)	F	.02		.28		.0039		.12	
	p	.89		.61		.95		.73	
Multivariate (4, 11 df)	F	.39							
	p	.81							

Correlation Matrix of Difference Scores

	Initial	Final	Mean	Slope
Initial	1.00			
Final	0.12	1.00		
Mean	0.61*	0.46	1.00	
Slope	-0.40	0.69**	0.09	1.00

*p < .05
**p < .01

The initial difference scores of the pairs correlate positively ($p < .05$) with their mean difference scores. Final difference scores correlate positively with slope differences ($p < .01$), as shown in the correlation matrix, Table 3. The latter fact indicates that difference scores for the two groups are positively related to changes over time, i.e., changes in age.

Part II. Patterning of Behavior in Relation to Reaction to Stranger

Rationale. There was no basis for rejecting the hypothesized lack of difference between the Home and Center children in their reactions to strangers in the "miniature life situation." Since no difference was observed between the Home and Center infants, it was assumed that data on Home and Center infants could be combined. Also the data on the unmatched Home and Center infants were pooled to provide a larger N, to yield more information about how babies, in the age range 3 to 48 months react to a stranger. From the literature, one might anticipate that there would be some pattern to this kind of behavior. Based on reports in the literature, the investigator had hypothesized that reaction to a stranger would be intense from about 6 to 12 months of age and that the reaction would "peak" again between 24 and 30 months as the two year old, in the process of becoming more autonomous, became more negative in his response to a stranger.

Measures. Scores for all the subjects, matched and unmatched Home and Center infants, for whom observational ratings were available on reaction to stranger, were combined in an attempt to determine patterning of reactions, i.e., to determine whether reactions at one age are related to reactions at a later age. Also, all data obtained on boys' reactions were combined and all data obtained on girls' reactions were combined to determine whether there was a sex difference in the patterning of this behavior.

Pooled scores on ratings of reaction to stranger at each age were correlated with pooled scores at every other age for the combined sample (N = 57). Pooled scores for boys at each age were correlated with pooled scores at every other age, and means and standard deviations were computed; the same was done for girls.

Results. Mean scores and standard deviations at each age for the total sample (N = 57) indicated that the highest mean score was 1.96 at 18 months of age (Table 4). A rating of 1.96 is roughly equivalent to a score of 2.00, which means that the subject's reaction cannot be termed "fearful." What was evidenced was the children's awareness of a "stranger" or unfamiliar person and their ability to discriminate between familiar and unfamiliar persons (or family and non-family persons).

Table 4

Scores from Ratings of Observational Data on Reaction to Stranger for Combined Home and Center Sample

Age in Months	N	Mean	Standard Deviation
3	18	1.00	.00
6	26	1.15	.34
9	35	1.44	.51
12	44	1.90	.99
18	40	1.96	.78
24	44	1.91	.94
30	37	1.72	.80
36	27	1.65	.78
42	16	1.16	.44
48	14	1.21	.43

N = 57
Observations = 301

Scores at 12 months correlate positively with scores at 18 months ($p < .01$); scores at 18 months correlate positively with scores at 30 and 42 months ($p < .05$); scores at 24 months correlate positively with scores at 30 months ($p < .01$); scores at 30 months correlate positively with scores at 42 months ($p < .05$) as shown in Table 5.

The tester was instructed to notice if the children were aware of her as a "stranger." At 12 months of age a mean of 1.90 indicated that the ability to discriminate familiar/unfamiliar persons was

readily observable at this age, and the correlations further suggest that the children continued to respond along this dimension of discrimination in a characteristic pattern that shows a relationship from one age to another. There appears to be a definite patterning of discriminative behavior in response to strangers.

Table 6 gives the means and standard deviations of ratings of observational data on reaction to strangers for the total sample of Home and Center boys (N = 28) and for the total sample of Home and Center girls (N = 29).

Slightly higher means for the girls suggest that girls are somewhat more sensitive to the dimension of "familiar/unfamiliar" and a higher mean of 2.11 for the girls as opposed to a mean of 1.68 for the boys at age 12 months suggests that girls make this discrimination somewhat earlier. The standard deviations for the girls are larger, suggesting that there is more variability among the girls in their reactions to non-familiar persons than among the boys.

The correlations (Table 7) for the boys indicated positive relationships between reactions at 24 months and 30 months ($p < .05$). The correlations (Table 8) for the girls indicated a positive relationship between reactions at 6 months and 30 months ($p < .05$); between 12 months and 18 months ($p < .05$); between 24 months and 30 months ($p < .05$); and between 30 months and 42 months ($p < .01$).

A large portion of the patterning reflected in the correlational analysis of the total sample (N = 57) as shown in Table 5 is obviously contributed by the patterned behavior of the girls in the sample

(N = 29) as shown in Table 6.

The data for the total sample failed to confirm the hypothesis that reaction to strangers would be strongest between the ages 6 and 12 months; the "peak" reaction occurred at 18 months ($\bar{X}$ = 1.96). Actually, there were no "peak" reactions as described in the literature, i.e., there were no strong "fear" or negative reactions. Furthermore, the reactions did not become more negative, or did not "peak" again at ages 24 to 30 months as had been hypothesized. In fact, the function is curvilinear.

Data obtained on the girls, although they do not confirm the hypothesis, appear to be more in line with the investigator's expectations (based on the literature). Thus, the mean value, 2.11, of ratings at 12 months and the mean value, 2.12, of ratings at 18 months were the highest obtained, and there was another rise in mean score, 1.92, at 30 months. These scores, however, are not "peaks" in the sense of fearful reactions, but indicative of discrimination, or awareness of unfamiliar/familiar persons.

Whenever a large number of variables are correlated, a few significant correlations may occur by chance alone. Although there appeared to be a patterning in the reaction to stranger data, some of the correlations could be artifacts and nothing more. It may be argued, however, that this is not a chance finding; that the results are consistent in terms of what might be predicted on the basis of the growing child's expanding experience with strangers and his increasing discriminative learning ability.

Table 5

Patterning of Behavior in Relation to Reaction to Stranger:
A Correlational Analysis for Combined Home and Center Sample:

Age in months/N	6	9	12	18	24	30	36	42	48
3	.00	.00	.00	.00	.00	.00	.00	.00	.00
N	17	18	17	14	12	9	3	0	
6		.09	.06	.12	.28	.35	.00	.00	.00
N		25	24	19	16	12	5	3	3
9			-.09	.23	-.22	.02	-.31	.00	.00
N			33	26	24	18	8	3	3
12				.52**	.22	.05	.45	.35	.59
N				37	34	28	17	10	8
18					.29	.46*	.18	.65*	.65
N					34	29	20	13	9
24						.55**	.29	.46	.21
N						36	26	16	13
30							.07	.55*	.00
N							25	15	14
36								.004	.13
N								16	14
42									.35
N									.12

(N = 57)
* p <.01
** p <.05

Table 6

Sex Difference in Scores from Ratings of Observational Data on Reaction to Stranger

Age in Months	Boys N	Mean	S.D.	Girls N	Mean	S.D.
3	6	1.00	.00	12	1.00	.00
6	10	1.15	.34	16	1.16	.35
9	16	1.31	.40	19	1.55	.57
12	22	1.68	.87	22	2.11	1.08
18	23	1.85	.65	17	2.12	.93
24	22	1.82	.96	22	2.00	.94
30	18	1.89	.85	19	1.55	.72
36	14	1.39	.63	13	1.92	.86
42	9	1.11	.33	7	1.21	.57
48	6	1.00	.00	8	1.38	.52

Total sample of boys (N = 28) (Observations = 146)
Total sample of girls (N = 29) (Observations = 155)

Table 7

Patterning of Behavior in Relation to Reaction to Stranger Data:
A Correlational Analysis for Combined Home and Center Sample of Boys

Age in months/N	6	9	12	18	24	30	36	42	48
3	.00	.00	.00	.00	.00	.00	.00	.00	.00
N	5	6	5	5	4	2	1	0	0
6		-.33	.40	-.37	.79	-.88	.00	.00	.00
N		9	8	7	6	4	2	2	2
9			.13	-.08	-.11	-.29	-.09	.00	.00
N			14	13	11	8	4	1	1
12				.39	.07	.07	.42	-.36	.00
N				21	18	15	10	6	4
18					.08	.41	-.04	.36	.00
N					20	16	12	8	5
24						.56*	.31	-.25	.00
N						18	14	9	6
30							.29	.41	.00
N							13	8	6
36								-.30	.00
N								9	6
42									6

(N = 28)
*p <.05
**p <.01

Table 8

Patterning of Behavior in Relation to Reaction to Stranger Data:
A Correlational Analysis for Combined Home and Center Sample of Girls

Age in months/N	6	9	12	18	24	30	36	42	48
3	.00	.00	.00	.00	.00	.00	.00	.00	.00
N	12	12	12	9	8	7	2		
6		.27	-.08	.27	.12	.82*	.00	.00	.00
N		16	16	12	10	8	3	1	1
9			-26	.31	-.28	.28	-.52	.00	.00
N			19	13	13	10	4	2	2
12				.58*	.29	.06	.44	.58	.58
N				16	16	13	7	4	4
18					.45	.57*	.33	.78	.52
N					14	13	8	5	4
24						.58*	15	.66	.03
N						18	12	7	7
30							-.02	.88**	.29
N							12	7	8
36								.09	-.10
N								7	8
42									.45
N									6

(N = 29)
*p <.05
**p <.01

Part III. The Mother Separates Herself from the Child

Rationale. If "reaction to strangers" is a measure of attachment, then it should be related to attachment at some later developmental stage. The theoretical position states there is a relationship between an infant's "reactions to strangers" at a peak period (usually in the last half of the first year of life) and his attachment to his mother. His response in the presence of strangers at this age is indicative of the quality of his attachment to his mother. The stronger this attachment in infancy, the more independent and secure the infant becomes in later social interaction.

There should be a demonstrable relationship between "reaction to a stranger" at this peak period, as measured by the infant's fear and reluctance to go to a stranger and separate from his mother, and his later ability to feel secure and allow his mother to separate from him with less distress at age two and without distress at later ages, e.g., three to six years.

This notion is sometimes referred to as a proximal-to-distal hypothesis, i.e., the stronger or more negative the reaction of the infant when separating himself from his mother to go to a stranger at 6 to 12 months, the more positive his reaction will be when his mother separates herself from him at later developmental stages. This hypothesis predicts a negative, or inverse, relationship between these two attachment behaviors.

Design. A correlational analysis was planned to determine the relationship between the investigator's rating of subjects' "reactions to strangers" during the peak period (6 to 12 months) and their mothers' ratings of reactions to their being left at home by the mothers with a stranger at age two and "at the present time."

It was hypothesized that there would be no difference between the Home and Center children in the relationship (correlation) between these two indices of attachment.

Measures. A questionnaire was mailed with an accompanying letter (see Appendix C and Appendix D) to the mothers of the matched subjects in Home and Center groups. The mothers were asked to rate how their children reacted when they were left at home with an unfamiliar person, e.g., a babysitter, at age two. They were asked to make a second rating of how their children react "at the present time" when they are left with a stranger. The "present time" included for the sample an age range among the children of 30 to 72 months.

The use of retrospective data is assumed to be admissible, as Goulet and Baltes (1970), in a discussion of issues in research methodology, argue for the use of retrospective (and prospective) reports, and for the use of informants (parents, teachers, friends) other than the subjects whose otogenetic change is under study.

Age two was selected because Bowlby (1969) reports that once a child has entered his second year, typical attachment behavior is almost always seen, and up to the time a child reaches his third birthday this behavior is readily activated by the mother's departure or by anything frightening.

Analysis. The data on reaction to stranger obtained from ratings of the tester's observations revealed no strong negative reactions to strangers among either the Home or Center groups of infants. A statistical analysis indicated a lack of significant difference between the groups. When the data were combined for the total matched sample (N = 30), in the 6 to 12 month age range, the numbers of observations were as follows: six months, N = 14; nine months, N = 16; and 12 months, N = 24. The mean scores were 1.21, 1.41, and 1.96 for the 6, 9, and 12 month age groups respectively. The scores at 12 months, based on the largest N, reflected also the highest mean score for the three age groups. Hence, this was chosen as the age/rating score to be correlated with the mothers' ratings.

There was a 100 percent return on the questionnaires; however, three pairs were eliminated because they entered the study after age 12 months, and one pair had to be eliminated because one mother's rating was unclear. Eleven matched pairs were obtained with data at 12 months and at 24 months; one of the 11 pairs was age 24 months at time of questionnaire and there were no additional data for "at the present time," reducing the pairs to 10 for that portion of the correlation.

The project secretary coded the questionnaires. The investigator did not know whether a particular mother-child dyad belonged in the Home or the Center sample, a policy followed in all the data analyses throughout the entire study.

The investigator had perhaps not accurately conceptualized the problem, because the mothers' comments on the questionnaires indicated that 9 of the 28 children had never been left with "a stranger" at age two. This did not seem to negate the results, however, as the mothers reported protest even when being left with someone quite familiar. The mothers also included explanatory notes to make it clear that if the sitters were strangers they always allowed a period of time for child and sitter to get acquainted. The data reflect more accurately perhaps the children's response to their mothers' separating themselves (from the child) than a fear of the stranger or dislike of the babysitter.

Results. Table 9 indicates there is no significant relationship between the ratings on the infants' reactions to strangers at 12 months and their mothers' rating of the infants' being left by them with a babysitter, or "stranger" (or even with someone familiar). This finding of no significant relationship applies to both Home and Center groups. Although not significant, the negative correlations in both groups are in the theoretically predicted direction. They reflect a slight proximal-to-distal trend.

To test the difference between Home and Center correlations (.27 and -.07; .006 and .38, and -.22 and 0.17, Table 9) using a z transformation of each r, the standard error was computed in z-score form for the difference between these values. The z values for each of the three differences, +71, -.78, and -11, respectively, were less than the ±1.96 required for the .05 level of confidence. Therefore,

there was no basis for rejecting the null hypothesis of no difference in population correlations.

Table 9

The Relationship Between Two Indices of Attachment: A Correlational Analysis of the Relationship Between Infants' Reaction to Stranger and Reaction to Mother's Leaving

Matched Home Children			Matched Center Children		
	MR-24	MRPT		MR-24	MRPT
RS-12	.27	.006	RS-12	-.07	.38
N	11	10	N	11	10
MR-24		-.22	MR-24		-.17
N		10	N		10

RS-12: Investigator's ratings of infants' reaction to stranger at 12 months

MR-24: Mothers' ratings of their infants' reaction to being left by the mothers when the infants were 24 months old

MRPT : Mothers' ratings of their infants' reaction to being left by the mothers at the present time (covering an age range of 30 to 72 months)

Part IV. Exploratory Behavior

Rationale. A child who has a healthy attachment to his mother is believed to be able to use the mother as a secure base from which to explore. A child who does not have such an attachment may behave with a less free exploration of his environment. Thus, he might have fewer opportunities to learn. The Final Report (Keister, 1970a) on the Demonstration Project showed that there is no difference between Home and Center children on scores on the Bayley Scales of Infant Development (Mental and Motor). There was, however, some thought that though the Home and Center groups had similar over-all scores, the scores for the two groups might have been derived from different items.

If the children in the Home group obtained a greater portion of their total mental test scores from successfully passing the exploratory items than did the Center children, one might hypothesize a better quality of attachment of the Home children to their mothers.

Measures. The tester who administers the Bayley Scales of Infant Development (Mental and Motor) has been testing the infants in the Project since its beginnings in 1967. She was asked to identify those items on the mental test which she would classify as exploratory, i.e., those items which require the child to explore, to search, to look for, to examine, to discover for himself, to investigate. Any item that might otherwise have been labeled "exploratory" but which the tester demonstrates before she asks the

child to perform was classified "exploratory-imitative" and then eliminated from this list. Those items chosen as exploratory were ones requiring the child to initiate the response. A list of the 30 items which were identified is given in Appendix E.

Exploratory items used in the analysis were obtained from a total of 98 Bayley Mental tests, 49 of which were administered to 14 Home children, and 49 to the 14 matched Center children. The tests covered an age range of five to 30 months. Data were analyzed for 14 matched pairs. One pair was eliminated from the matched sample because this pair entered the study at age 24 months and the two children had had only one Bayley test each before the Stanford-Binet test began to be used.

Analysis of Data. For each matched pair the following exploratory test item difference scores were computed: initial score difference, final score difference, mean score difference, and slope difference. A multiple analysis of variance was performed on these four differences. Table 10 contains means, difference means and standard deviations, univariate and multivariate Fs, and significance levels.

Results. The mean differences in initial, final, and mean scores, and slopes were not significantly different from zero as indicated by the univariate F values and significance levels, nor was the multivariate F (the vector consisting of the four mean values) significantly different from zero.

Table 10

Analysis of Matched Sample Exploratory Data

Multiple Analysis of Variance

N	Group		Initial Scores Mean	S.D.	Final Scores Mean	S.D.	Mean Scores Mean	S.D.	Slopes Mean	S.D.
14	Home		6.71		22.86		14.63		1.435	
14	Center		6.93		23.43		14.82		1.443	
Pairs 14	Mean Difference		-.22	.015	-.57	.026	-.19	.016	-.008	.299
Univariate (1, 13 df)		F	.26		.64		.18		.01	
		p	.62		.56		.68		.91	
Multivariate (4, 10 df)		F	.24							
		p	.91							

Correlation Matrix of Difference Scores

	Initial	Final	Mean	Slope
Initial	1.0000			
Final	0.0961	1.0000		
Mean	0.6891**	0.5829*	1.0000	
Slope	-0.2161	0.6075*	0.2918	1.0000

*p <.05
**p <.01

The null hypothesis could not be rejected as there was no difference in performance on exploratory items of the Bayley Mental test between Home and Center children.

Although the difference between the Home and Center children's performance on exploratory items was not significant, those small differences which do exist are negative. Since scores earned by Center babies were subtracted from scores earned by Home babies, negative differences favor the Center children. Table 10 indicates that the Center children's performance on exploratory items is slightly better than that of the Home children.

This finding of no difference in Home and Center children on performance of exploratory items can be interpreted to mean that enrollment in the Center has not diluted the Center children's primary attachment to their mothers as this attachment relates to or is necessary for successful performance on exploratory test items.

Table 10 also gives a correlation matrix. Initial difference scores for the pairs correlate positively with mean difference scores; mean difference scores correlate positively with final difference scores, and final difference scores correlate positively with slope differences. These significant correlations indicate that increases in scores over time correlate positively with an increase in age; i.e., performance is related to age.

Part V. Eating and Sleeping Behavior

Rationale. Disturbances in eating and sleeping behavior of children are regarded in many instances as indications of some kind of emotional upset or problem. If the Center babies were upset by their lives and the routines in the Center program and by the fact of being separated from their mothers during the daytime hours, it is reasonable to assume that their anxiety would be reflected in observable changes in their eating patterns and in changes in sleeping routines.

Measures. With the use of a variable schedule of randomly spaced telephone interviews averaging one per month, mothers of babies in the Home and Center groups were questioned about variations and difficulties in their infants' eating and sleeping behavior. Data have been tabulated for responses to these three questions:

1. Has (child's name) ____ been eating well since last _____? (The day cited covers a period of one week, e.g., "since last Tuesday, a week ago?")
2. Has (child's name) ____ been sleeping well since last _____ ? (Same as above, covering a period of one week.)
3. In the last two weeks, have there been any changes in his/her sleeping routine? (E.g., wakefulness at night, shift in nap times, shorter naps, more time spent sleeping, etc.)

Analysis of Data. The first two months' interviews by telephone, as close as possible to the time a Center child entered the program, were compared with his matching Home child's mother's interviews for the same two months (i.e., at the same age) to determine whether the mothers' reports of eating and sleeping behavior might possibly reflect disturbances or problems resulting from the necessity to adjust to the Center's program.

Responses to these three interview questions were also tabulated for all of the months for which there was a one-to-one correspondence of dates (ages) of interviews for the matched pairs. Results are based on a total of 392 interviews, 196 for each group.

Results. A tabulation of mothers' responses to the three questions on eating and sleeping for a period covering two months (as close as possible to time of entrance to the Project) for 14 Center children and for each matching Home child is shown in Table 11. (One of the matched pairs was eliminated because there was too much discrepancy between the ages of the Center child at entrance to the project and the age at which telephone interviews were begun for the matching Home child.)

Table 11 also shows the mothers' responses to the three questions on eating and sleeping for the 14 matched pairs of Home and Center children over a period of eighteen months. The data are based on a total of 392 telephone interviews, 196 with mothers of Home children and 196 with mothers of Center children. The data covered an age range for the infants of 4 to 42 months.

Table 11

Mothers' Telephone Interview Responses to Questions Relating to Eating and Sleeping in Matched Sample of Subjects

First Month After Entrance Into Study Group

Group	N	Interviews	Eating Well? (one week)		Sleeping Well? (one week)		Major Changes In Sleeping Routine (two weeks)	
			Yes	No	Yes	No	Yes	No
Home	14	14	11	3	12	2	4	10
Center	14	14	11	3	14	0	2	12
			t = 0		t = 1.48		t = 1.00	

Second Month After Entrance Into Study Group

Group	N	Interviews	Eating Well? (one week)		Sleeping Well? (one week)		Major Changes in Sleeping Routine (two weeks)	
			Yes	No	Yes	No	Yes	No
Home	14	14	10	4	13	1	3	11
Center	14	14	6	8	10	4	3	11
			t = 2.29*		t = 1.36		t = 0	

392 Telephone Interviews

Group	N	Interviews	Eating Well? (one week)		Sleeping Well? (one week)		Major changes in Sleeping Routine (two weeks)	
			Yes	No	Yes	No	Yes	No
Home	14	196	162	34	178	18	46	150
Center	14	196	155	41	170	26	36	160
			t = -.0427		t = -.63		t = 1.04	

Note.—The age range of the children was from 4 to 42 months.
*p < .05

A test of significance (t test) (using a formula for correlated means) was used to determine whether a child's eating patterns and sleeping routines during the first month and for the second month he was enrolled in the Center program differed significantly from the eating patterns and sleeping routines of his matched control in his own home. Results are shown in Table 11. The only statistically significant difference was in response to the question, Has (child's name) been eating well since last _____? (with the day specified covering a period of one week). More Center mothers responded 'No' to this question during their infants' second month in the program.

Tests of significance (t tests) were also used to evaluate differences in matched pairs over a long period of time. In some instances there were as many as 20 interviews for each child in a matched pair, the fewest being 6 interviews for each child in a matched pair, covering a six-month period. None of these t values was significant.

CHAPTER IV

SUMMARY AND DISCUSSION

The present study was undertaken to investigate some aspects of the effects of day care on infants' emotional and personality development. Infants enrolled in a demonstration day care center were compared with a matched sample of infants cared for in their own homes by their own mothers. Little or no difference was found between the two groups. A summary and discussion is given separately for each of the five measures of emotional and personality development which were used to assess the two groups of infants.

Reaction to Stranger

Results of the present study indicated that there was no difference in reaction to a stranger between infants enrolled in a center providing quality day care and infants being cared for in their own homes. Observational data supported the proposition that the Center babies were friendly and socially responsive to adults. There was further anecdotal evidence among staff and observers of mature social behavior in this group.

In the mornings a child enrolled in the Nursery Center may sometimes be reluctant to say good-bye to the parent who brings him, while at other times he may run eagerly to greet his caregiver. At the end of the day the babies appear happy to see the parent who comes for them; even the youngest ones greet the parents with warm

smiles and animation. There is nothing in their observable behavior to suggest that anything is lacking in their attachment to their mothers. They respond warmly and appropriately. The evidence from this study fails to support the statements that infants fear a stranger in the second half year of life, and seriously questions "fear of the stranger" as indicative of the quality of attachment to the mother. In the sample of 30 children in matched pairs, 15 reared at home with their own mothers and 15 enrolled in a group day care setting, out of a total of 156 observations only two Home children and one Center child rated scores of 4 (strong resistance on the part of the child to leave his mother and go to the tester); however, none cried, and no responses were described as "fearful."

What is evidenced by the children in this study may be a definite "awareness" from 12 months onward that the tester is "a stranger." The babies have perhaps learned to discriminate between their family members and unfamiliar persons. The tester frequently reported that a child at first would act a little shy or coy, maybe turn his head away, but then would turn and give her a big smile and allow her to pick him up. This kind of reaction suggests that the child is responding to someone new and strange, but the reaction is not one of fear or withdrawal. These descriptions are comparable with Spitz's description of "coy, to bashful behavior, and the turning away" (Spitz, 1946).

The term "fear" appears from the present study to be a misnomer, and the findings support the position of Rheingold and Eckerman (1970) who question the fear-of-stranger concept.

In this study, the "experimental" condition involved the mother's presence at all times. This may explain the failure to find fearful or strong negative reactions to strangers. What has often been inferred in other studies to be fear of the stranger may have been the infant's distress at the mother's leaving or at the possibility of her leaving. Bowlby (1969) states, however, that strangeness per se is a common cause of fear in infants, and that there is no reason to look for any explanation of why an infant withdraws from strangers other than that he is alarmed by their strangeness. He argues further that fear of strangers is a response distinct from separation anxiety. He states that when the infant's mother is simultaneously in sight the infant may show fear of a stranger. In the present study, in 301 repeated observations of infants from 2 to 48 months there were only nine strong/negative responses to the examiner. Only two of these occurred at 12 months; one occurred at 18 months; two at 24 months; and one each at 30 and 36 months. In every other instance the examiner had little or no difficulty in getting the child to come to her.

Many of the earlier studies and observations of fear of strangers date from a time when mothers could make arrangements rather easily to keep their babies at home (e.g., extended families, nursemaids, etc.).

In the past, there was less protection through immunization against illnesses and diseases, less ease and mobility in traveling. These and other factors probably tended to limit infants' experiences with unfamiliar adults.

Today infants from birth onward experience life as a series of strange situations, beginning with the variety of sights and sounds of the hospital delivery room. As young as one week of age, infants are taken everywhere -- from supermarkets to air terminals. The six- or eight-month-old infant today may easily be a world traveler. He has had infinitely more experience with strangers and strangeness than infants of two or three decades ago.

Failure to find fearful or strong negative reactions to strangers could be due to the fact that the "miniature life situation" and the rating scale devised to score the infants' reactions to the situation were not reliable techniques of measurement. The rating scale was devised prior to a 1969 publication by Bowlby in which he described an infant's response to the sight of a stranger. Citing studies by Freedman (1961), Schaffer (1966), and Ainsworth (1967), he stated that the infant goes through the following phases:

"(1) a phase during which he shows no visual discrimination between strangers and familiars;

(2) a phase usually lasting six to ten weeks, during which he responds to strangers positively and fairly readily, though not as readily as to familiars;

(3) a phase, usually lasting four to six weeks, during which he sobers at sight of a stranger and stares." pp. 324-325

He reported that these three phases are followed by a fourth phase in which behavior typical of fear, e.g., orientation and movement away from the stranger, whimpering or crying, and a facial expression of dislike will be observed.

The investigator offers Bowlby's four stages as a criterion for the face validity of the rating instrument devised in the present study to differentiate infants' reactions to strangers at different ages. The rating scale used in the present study differentiates these reactions comparably with Bowlby's descriptions.

Patterning

The results indicate that both Home and Center children show an appropriate and intelligent awareness of and the capacity to discriminate between familiar family members and unfamiliar adults. This capacity was evidenced by age 12 months (and in some individual cases even earlier). The children continued to respond to this dimension of "familiar/unfamiliar" in a characteristic pattern that shows a relationship from one age to another.

In the larger sample of Home and Center children (N = 57) the patterning was markedly noticeable; however, an examination of the patterning of data on reaction to stranger, analyzed for sex differences, indicated that girls are perhaps more sensitive to the dimension of "familiar/unfamiliar" than boys. The change in this behavior among girls over time was significant and perhaps contributed in large measure to the patterning observed in the larger sample. There was some relationship of this behavior among boys, but it was much less pronounced and in most instances not significant.

The Mother Separates Herself from the Child

For the matched sample, data had been obtained on infants' reaction to a stranger at 12 months of age. These data (ratings) were correlated with mothers' reports of their children's behavior when they were left at home at age two and "at the present time" (covering an age range of 30 to 72 months) with a stranger (or a babysitter). In nine cases the mothers reported that the child was not left with a stranger. It was evident from the mothers' comments that the children's responses were best interpreted in practically every instance not as a response to the stranger, but as a response to the mothers' leaving.

If, as the research literature states, reaction to a stranger is indicative of the child's attachment to the mother, then it should be related to some other index of attachment, e.g., the child's response to his mother separating herself from him. The proximal-to-distal hypothesis states that the child who has a healthy attachment to the mother in the second half of the first year of life is the child who moves from proximal-to-distal behavior in relation to the mother at later developmental stages.

A negative reaction to strangers in the second half of the first year of life is considered to be indicative of attachment. Thus, children who were rated highest on reactions to strangers at 12 months would be expected to have lower-rated scores based on their responses to their mothers' leaving them. It would be expected that when the scores on these two dimensions were correlated there would be evidence of an inverse, or negative, relationship.

The correlational analysis for both Home and Center children nevertheless revealed no significant relationship between the two indices of attachment. The proximal-to-distal hypothesis was only weakly supported by a slight negative trend in both groups.

A statistical test supported the hypothesis that there would be no difference between the Home and Center populations in the correlation between the two variables, infants' reaction to a stranger and reaction to their mothers' separating from them.

It may be that discrimination of non-family persons should be recognized as a developmental milestone in the infant's learning, and that learning very early to take cues from a number of experiences that unfamiliar adults can be trusted may be a far more advanced social response than extreme anxiety or fear.

Fear may have been an appropriate response in some of the earlier studies. These were often case studies of children whose learning was based on an experience which taught that the world was not to be trusted. Those children had learned very early that life was full of anxiety-provoking experiences.

Reaction to a stranger appears to reflect what the child has learned from his past experiences. Given a good quality attachment to his mother, developed in a life-history of having his expectations of "the good life" confirmed, the infant is free to develop positive social behavior as he generalizes his trust in

his mother to other family members and to adults in general. Generalization may be facilitated to the extent that unfamiliar adults are perceived by the infant as similar to his mother, i.e., warm, responsive, and friendly. A re-examination of the fear-of-stranger concept seriously questions "fear" as indicative of quality attachment. To the extent that the infant perceives an unfamiliar adult as stern and foreboding, his "fear" may reflect his intelligent awareness and ability to discriminate between a threatening and non-threatening person. To a large degree, however, most adults respond warmly to infants.

Protest at being left by the mother may well be indicative of quality attachment. If the mother is the dispenser of those attentions most sought by the child and if indeed she herself is the most desired goal-object, the infant will protest her leaving him. The degree of protest will vary, however, as a function of each mother-child dyad pattern of behavior in separation situations. This was evidenced in the comments added by the mothers in their responses to the questionnaire. The mothers used the following techniques to help the children deal with separations:

(1) explanations of why she had to leave and reassurance that she would be back soon

(2) familiarization with the person with whom the child was to be left and

promises that staying with this person would be pleasant, i.e., that the child would have a good time

(3) substitution for the mother by a favorite family member, grandmothers, cousins, an older sibling

A few mothers said that they infrequently left their children. They also reported strong protest. These children learned readily that vigorous protests were rewarded. As one mother expressed it, "... looking back, I think he had learned he could control me and was doing just that."

Exploratory Behavior

The statistical test (a multivariate analysis) indicated there was no difference between the Home and Center children on their performance on exploratory items of the Bayley Mental Test. Although there was no statistically significant difference between the two groups those small differences which were found seemed to favor the Center children.

The exploratory items were those Bayley (Mental) test items which required the child to initiate looking, searching, discovering, or investigating. These kinds of responses are intimately related to enlarging the child's experiences for learning. E.g., a small toy is placed on the table before the child by the examiner who covers it with a small cloth. The child is given credit for passing

the item if he removes the cloth with the evident purpose of securing the toy either by looking under the cloth for the toy or by pulling the cloth aside and reaching for the toy with an animated expression, vocalizing, etc. In another instance the examiner places an open picture book before the child and gives him credit for passing the item if he turns the page, however clumsily, on his own initiative. No structured curriculum or "cognitive stimulation" per se is a part of the Center's program. Yet these results and an earlier report (Keister, 1970a) which also showed a slightly higher overall performance on the Bayley Mental test among the Center children, lend support to the position of Dr. Mary Elizabeth Keister, the Project Director. She has stated (1970b) that learning is facilitated in the context of quality infant care modeled on the "good home" and the "good nursery school" of the much-maligned middle class.

It is also important to recognize the fact that the tester who administered the Bayley Scales was in a very real sense a stranger to the infants. Although she interacted with the infants (as opposed to the tester who recorded the "reaction to stranger" data and who interviewed the mother) her presence probably introduced an element of strangeness, particularly for the younger children.

On the face sheet of the Bayley examiner's record form there was space allotted for Examiner's Notes where she was instructed to record any special circumstance that she felt might have interfered with test performance. Trained as a psychologist, she allowed a "warm-up period" to put the infants at ease, in order to enhance their performance. She reported a few instances in which a child became very tired, or there was interference by other children or by noise, but never any instance in which the testing session was hampered by fear or by clinging to the mother.

It appears that enrollment in the day care center has not affected the Center babies' primary attachment to the mother as this attachment is reflected in performance on exploratory test items. From their successful performance at each age it may be inferred that the babies were "free to explore and to act on the environment."

Eating and Sleeping

Tests of significance (t-tests) of the difference between the mean number of mothers' responses to questions on eating and sleeping indicated no differences between the matched pairs of Center and Home children on all three questions ("eating well?", "sleeping well?", and "changes in sleeping routines?") for the first month after the Center children were enrolled. There were no differences between the two groups the second month after the Center children's

enrollment for the two questions related to sleeping; however, the mothers of Center children answered "no" to the question, 'Has your child been eating well during the last week?' significantly more than the mothers of children cared for in their own homes. The result of significantly more "no" responses to the question of eating well in the second month of adjustment for the Center children may reflect some difficulty in adjustment. On the other hand, it may be that at the Center the infants were offered solid foods and permitted to feed themselves with their fingers; possibly then they resisted their mothers' efforts to feed them at meal-time at home. They may not have been eating well at home because their mothers did not permit them the autonomy they had learned to enjoy at the Center.

The mothers in both groups reported no severe emotional upsets or problems related to their infants' eating and sleeping behavior.

The kinds of responses obtained suggest that all of the 30 children had very similar eating and sleeping behaviors. In both groups changes or problems were usually explained by the mother by such statements as "he hasn't been eating well this week, but he has such a terrible cold," or, "She hasn't been sleeping well the last few days, but we have been on vacation and she was so off schedule that she hasn't settled back to her usual routine."

Some mothers are sometimes reluctant to admit problems in eating and sleeping because they view such problems as indicative of failure on their part as "good mothers." Rationalizations about why the children had problems may or may not be valid explantions, but they were typical of both Home and Center mothers.

The telephone interviews began with some infants as young as 4 months and with some subjects were continued until age 42 months.

Glass (1949) came to the tentative conclusion that day (nursery) care had no unfavorable effects on eating and sleeping (and other aspects of development studied) in a comparison between home and day care children, and she extended this conclusion to state that there was no evidence that nursery care for children under two is especially harmful. Her sample consisted of two groups of 48 children, aged between 20 and 62 months.

In the present study there was very little evidence of undesirable effects on eating and sleeping and this study involved even younger children (4 months to 42 months) than in the Glass study.

Evaluation

In the present study the sample was small and conclusions must be tentative. Yet it would seem that the possibility of providing all-day care for babies that is comparable to home care does exist. It is imperative, however, that results of this study be interpreted as occurring in a program designed to provide each

child "quality day care." Although this program of infant day care does not appear to have inherent in it the damaging or deleterious effects attributed to "institutional" care, one must not be too quick to infer that all day care of infants in groups is necessarily "good." Some institutions have been able through careful planning to provide more adequately for the needs of children for whom this kind of care is necessary; similarly, infant day care can be designed to replicate quality home care. Always there is the reminder of potential dangers if the needs of infants are not sensitively met. Home care is not always adequate, and babies in their own homes do not always thrive. At the risk of being redundant, it is imperative to emphasize that careful attention in any setting must be given to those aspects of child care which we know to be essential. To state cautiously that infant day care may not be damaging to babies one must haster to qualify that statement by defining the kind of day care that is involved.

CHAPTER V

IMPLICATIONS: THEORETICAL AND PRACTICAL

The present study indicated that infants in both the Center and home settings are developing similarly. There were no important differences between infants enrolled in day care and infants reared at home on measures believed to be indicative of attachment. One could infer that both groups have attachments to their mothers that are of comparable quality.

The Acquisition of Attachment

The newborn infant comes equipped with a repertoire of responses (crying, kicking, and the precursor of smiling) that serve to elicit the mother's care. Attachment of the infant to the mother may develop rapidly in the course of early S-R associative pairings as the mother routinely cares for him. She provides satisfaction (reinforcement) as she meets his physiological needs and alleviates his discomfort.

Attachment may depend on how the mother meets the child's primary need for neurological stimulation, on how she provides him with the most satisfying and perhaps most potent of all stimuli for the human organism -- the sound of her voice, the sight of her face, as well as smells, warmth, and handling.

Attachment is easy to recognize when one "sees it," and it is tragically conspicuous by its absence. It may be lacking in an infant who has had adequate physical care but whose neurological needs have not been met -- all of the components of human contact have been so minimal as to preclude normal development.

Very rapidly the "good" mother's responses to her infant's needs become contingent upon his cues -- his cries, his protests, his signs of discomfort. His relief from discomfort and his very early smiling (or what she interprets to be smiling) condition her nurturant care. More importantly for the infant's socialization, he quickly comes under her stimulus and reinforcement control. She not only makes life comfortable but she also makes it interesting. Her contingent responding serves to provide a consistency between what he does and the consequences of his acts. His sensations become ordered in some repetitive, dependable way so that at first dim, then clearer and clearer perceptions emerge. The mother is the agent whose consistent responses serve to integrate the infant's sensations into meaningful experiences. She helps him "to make sense out of" the stimuli that bombard him. This is inferred in the very young infant but observable in the slightly older infant who bumps his head and looks at his mother to judge from her cues whether or not he should cry.

In a day care center, where the ratio of staff to infants is low (where, for example, one adult cares for 15 or 20 infants), this one adult cannot respond to each infant in terms of an individualized

need-demand schedule. The infant's cry may not serve to elicit caregiving; instead his care may occur in terms of some arbitrary schedule that gets to each baby in turn. If his caregiver does not or cannot respond contingently to his stimulus-cues, the infant learns that he cannot effectively act on his environment -- or more simply his behavior does not have predictable consequences. Non-contingent responding results in less learning (i.e., what response follows what stimulus), weak attachment and little socialization.

The problems for the infant will be compounded in a situation where there are a number of different caregivers, and where caregiving responses are not only non-contingent but also inconsistent. The learning task then becomes for the baby almost overwhelming. There can, of course, be non-contingent and inconsistent responding in the baby's own home with his own mother. This is evidenced along a continuum with the "failure to thrive" syndrome at one end and "overmothering" at the other.

If an infant cries and his mother or his caregiver appears "on cue" with his bottle and there is the pleasant sensation of food in the stomach, and the way he is held is the way he was held before, and if the voice is the same, the contour of the face is the same, the warmth and patting and the smells all "go together," we may infer that the infant has some global, satisfying, faint perception of what he is experiencing. In a short time we observe that this same infant who cried may cease crying at the sound of his mother's voice or footsteps, or if her face appears above him. He stops crying in anticipation of

what he has learned to expect. He has learned that what he needs and wants will be forthcoming. In order for this kind of learning to occur his needs must be met promptly and consistently.

For the slightly older child "good mothering," or contingent and consistent responding, may mean providing a hug, a warm lap and a band-aid when it is needed, or giving a big smile to the child who has been struggling to put his jacket on all by himself and who finally makes it. The caregiver is available to listen to the child, to encourage and reward his attempts to talk. She encourages his efforts and is genuinely interested in what he says to her.

Center Care

In the Demonstration Project, the babies experience a ratio of one adult to five babies. The adult, always in attendance in the same room with the same infants each day, attempts to provide "good mothering," i.e., contingent and consistent responding to each infant's individual needs. A trained caregiver does not just supply a bottle on demand; she also responds to the baby's restlessness and knows when he needs to be picked up, to be talked to, to be held. While she may have to delay gratification of his needs while she is taking care of another infant, she calls to him, she tells him she is coming, or she may find a quick substitute -- a toy to interest him -- until she can give him her full attention. This is not unlike what his mother would do for him at home if she were caring for another child or busy at some household task. An infant who enters the

Nursery Center at the age of three months has a primary caregiver with whom he stays until about age 10 months, then he moves to another room with another caregiver to stay until he is possibly 18 months, then to another at 18 to 30 months, and yet another from 30 to 48 months. Each transition is made at the child's own pace and when he seems ready to move, in terms of what he is capable of doing (e.g., walking alone) and what he likes to do. New attachments are formed but old ones are maintained. In addition to providing contingent and consistent care within the Center, an effort is made to provide for the child in the Center the kind of care which is a continuation of what he has learned to want and to expect at home. Before the infant's entrance, the Center director questions the mother about how she cares for her infant, how she soothes him when he is upset, how he likes to be held when he is fed, what kind of blanket or soft toy he prefers. Attention to these details which the infant's caregiver attempts to replicate makes the transition from home to Center easier. The infant is not required to cope with too many changes in his environment and in his routine at the same time that he is expected to cope with the effects of change and of separation. The caregiver's contingent responding which is possible because she does not have too many babies to care for, her consistency of care by virtue of her being with him every day, and her attempts to make her care a continuation of the kind he has at home, all combine to create an attachment between the infant and his daytime caregiver.

All the same, the new caregiver does not displace his mother as the primary attachment figure. He covets his caregiver's smiles, her attention, and her praise, but those of his mother are the most sought after and she remains at the top of the hierarchy of his reinforcers. In the Center he must learn to share his caregiver with four other infants. At home he may share his mother with other family members, including siblings, but usually he does not share her with any other infants.

As some of the babies were very young at entrance to the program, it appears that at least rudimentary attachments to the mother can be acquired at an early age and that these are strengthened as time goes on, if the separation period is not too long -- for the babies in this study it was approximately 8 to 9 hours a day, five days a week -- and when there is continuity in the relationship with the mother mornings, evenings, and over weekends and holidays.

Speculations

Little is known about effects of group care on infants. The research evidence is minimal. Nevertheless, this investigator is willing to hazard a few guesses -- or speculations -- based on her observations of the Center program over a four year period.

In providing consistency of care, the investigator believes, there is a reinforcing "fringe benefit" both for mothers and infants. The model selected by the Demonstration Project is a replication of "good mothering." At the same time that replication of what the

mother does makes adjustment easier for the child, it may also reinforce the mother. This model says to her, "You are the one who knows best how to care for your child; tell us at the Center how you do it." In learning theory terms, this subtle but strong positive reinforcement for the mother very possibly increases the probability that she will continue to be a "good mother." The mother's self-concept is enhanced; she feels less guilty about placing her child in day care; she is confident that she has made a good decision and that she can make other good decisions about her child's care. Being asked how she does it, she feels she can share her child with someone else who will care for him but who is not trying to usurp her maternal prerogatives. As decisions continue to be made, the mother is recognized as the authority.

It appears that the caregivers are reinforced because they are told they have been identified as capable of giving warm, affectionate, individualized care to babies. The importance of their job responsibility is made very explicit. They are given a period of in-service training in which they are allowed to choose the age group in which they feel they can give the most competent care. They are selected because they care about as well as have the ability to care for children.

The "competent mother" and the "competent caregiver" share in the accomplishment of the child who is the beneficiary of their attitudes of self-esteem and competence. Their attitudes are reflected in his own feelings of self-esteem and competence. He acts

on his environment secure in the knowledge that what he does has consequences and is important to those special adults, his mother and his caregiver.

Research Needed

The acquisition of attachment is an interaction process. Mother and infant and caregiver and infant have to become active participants in a situation in which each learns to respond to the other's cues.

A great deal of research is needed to understand the complexities of this interaction process. Little is known, yet it is crucial to development. The need is all the more urgent because infant day care services are mushrooming. Infants are vulnerable, and it is imperative to identify the specific aspects of day care which make it good for babies.

More research is needed to analyze the components of contingent-responding. For example, different caregivers may differ in the amount of verbalization involved in their responses to children's needs and demands. How much labeling and specifically attaching words to actions is evidenced? Is the reinforcement to the child accompanied by explanations of why he is being reinforced? Are there ages at which it is more important to have responses that are in a large measure accompanied by verbalization or is it equally important at every age? A great many questions relating to types of infant-adult interactions and their subsequent effects on development remain unanswered.

Everything that happens to the infant and for him in the context of his daily living constitutes his learning environment. If he is to learn competence, to develop a sense of security, and to achieve healthy emotional and personality development, it is important to understand more fully the interactions that occur between him and the adults in his environment, both at home and in a group care setting.

More detailed and definitive analyses of actual care-giving situations need to be researched and the results incorporated with more precision into training techniques for caregivers.

Many are demanding day-care for infants. Those concerned about children's healthy development must demand quality day care. In the era of the seventies "the rights of infants" must be extended to include these rights in a day care setting as well as a home setting. "Quality day care" must be defined more and more quantitatively if facilities are to provide care which meets the special needs of infants.

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APPENDIX A

A TECHNIQUE FOR ASSESSING ATTACHMENT BEHAVIOR

Reaction to Stranger: A Miniature Real-Life Situation

This technique is designed to test a child's readiness, or willingness to separate from his mother to go to a stranger. The examiner (who in this study conducts the PAR-Vineland interview) observes the infant's reaction to her when she arrives and observes the infant's behavior as she attempts to get him to come to her. The examiner may offer the child a toy. The mother is always present with the child in his own home.

The examiner is particularly asked to note whether or not the child appears to be aware that she is a stranger, and to observe if the child shows any signs of fear.

A narrative account of the child's behavior (s) is recorded on the face sheet of the PAR-Vineland interview form following the testing sessions which are scheduled quarterly up to the age of 12 months and semi-annually thereafter.

The tests are scheduled when the child is not sick and at a time when his mother says he is "at his best."

The examiner is not given the rationale for the inclusion of this measurement other than for its interest at face value.

APPENDIX B

"REACTION TO STRANGER" RATING SCALE

1. The child showed no objection to leaving his mother to come to the examiner.
2. The child seemed aware of the examiner as a stranger; seemed hesitant (as suggested by any mild, qualitative comment, e.g., "somewhat") but came to the examiner without protest.
3. The child ran to mother, but finally came to the examiner (qualitative comments, e.g. very or extremely shy).
4. The child refused to come to the examiner, protested, or cried and the examiner did not continue to try to get the child to come to her.

APPENDIX C

LETTER ADDRESSED TO MOTHER

Dear Mrs. _____:

We are again in need of your help in our continuing study of the "Home" and "Center" babies who have been, since 1967 on, the subject of interest for our study of infant care. With three of our "alumni" entering first grade this year, it hardly seems appropriate to talk about "our babies," however!

In connection with further studies we are making of social and emotional development in the Home and Center children, we are asking your help in answering a few brief questions relative to your child's reaction to your leaving him or her with a stranger - at age two, and at the present time. A more detailed explanation is given on the enclosed information sheet. Only a few minutes will be required to check the questions. A stamped, addressed envelope is enclosed to facilitate our obtaining your reply.

We are most appreciative of your cooperation, in the past and up to the present moment. Thank you again for your generous help. We shall send you an abstract of the study when it has been completed, a few months hence.

Sincerely and with thanks,

Minta M. Saunders
Assistant to the Research Director
Infant Care Project

Mary Elizabeth Keister, Director
Demonstration Project: Group Care of Infants

MMS:jf

APPENDIX D

REACTION TO STRANGER[1]: A QUESTIONNAIRE

Please read the descriptions carefully and decide if one item describes your child's behavior very accurately. If so, place an X by one - and only one - description. If you think your child's behavior falls somewhere between two of the descriptions, use the line below and place your X along the line where you think it should fall.

At the time _____ was approximately two years old (between 22 and 26 months of age), if I left him at home with a strange person, (e.g., a new baby sitter), he

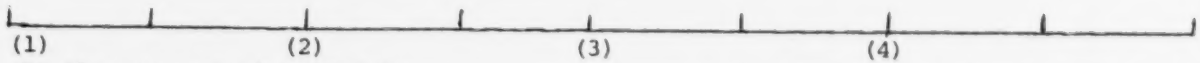
_____ 1) made no objection whatsoever to my leaving.

_____ 2) was not very happy at my leaving him. He protested by saying something like "don't go" but did not cry. Although he seemed a little sad or subdued, he began to "warm-up" to the sitter very quickly.

_____ 3) ran to me and clung to me, acted very shy toward the sitter, and was crying when I left the house, but not crying uncontrollably.

_____ 4) screamed, kicked, clung to me, cried and sobbed, and was very upset and distraught when I left.

Place an X where you think your child's behavior fits best along this line:



At the present time if I leave _____ at home with a stranger or brand new sitter, he

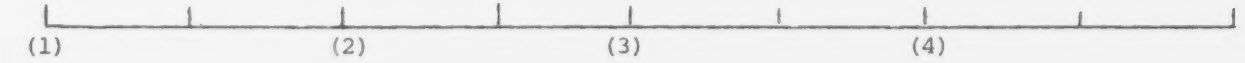
_____ 1) will make no objection to my leaving, and may even plan and anticipate a good time while I am gone.

_____ 2) will not be very happy or pleased at my leaving him. He will protest by saying "don't go" or "take me," but he will not cry.

_____ 3) will be very unhappy. He will cry and fuss, and try to alter the situation, either trying to persuade me not to go or to take him with me. He will reject the sitter (or stranger) at first, but will stop crying fairly quickly after I leave and will get along nicely with the sitter after I am gone.

_____ 4) will kick, scream, throw things, cry and sob uncontrollably. He may try to follow me out of the house, and the sitter may have to restrain him forcibly.

Place an X where you think your child's behavior fits best along this line:



NOTE: It may be that one or both of these sets of circumstances does not fit your situation. If you never have had an occasion to leave your child with a stranger but left him with someone other than his father, please explain in the space below why you have not left him with a stranger, and who the person is with whom he is left. Then describe in the space below how he behaved on those occasions when you left him at home with this person. Be sure that you describe how he behaved at the age of two and how he behaves at the present time.

_____

_____

_____

_____

[1]It is important that this be the mother's report of her child's behavior.

APPENDIX E

EXPLORATORY ITEMS ON BAYLEY SCALES OF INFANT DEVELOPMENT (REVISED): MENTAL TEST[1]

Item Number	Item Number
77	121
83	125
86	126
88	130
90	131
91	133
96	134
103	139
105	142
107	146
111	150
113	152
116	155
117	156
119	159

[1]A description of the items and the testing procedure for their administration may be found in the Manual of Directions for Bayley Infant Scales of Development (Revised), Mental and Motor. The new standardized edition by Nancy Bayley was copyrighted in 1965. The publisher is the Psychological Corporation, 304 East 45th Street, New York, New York 10017.